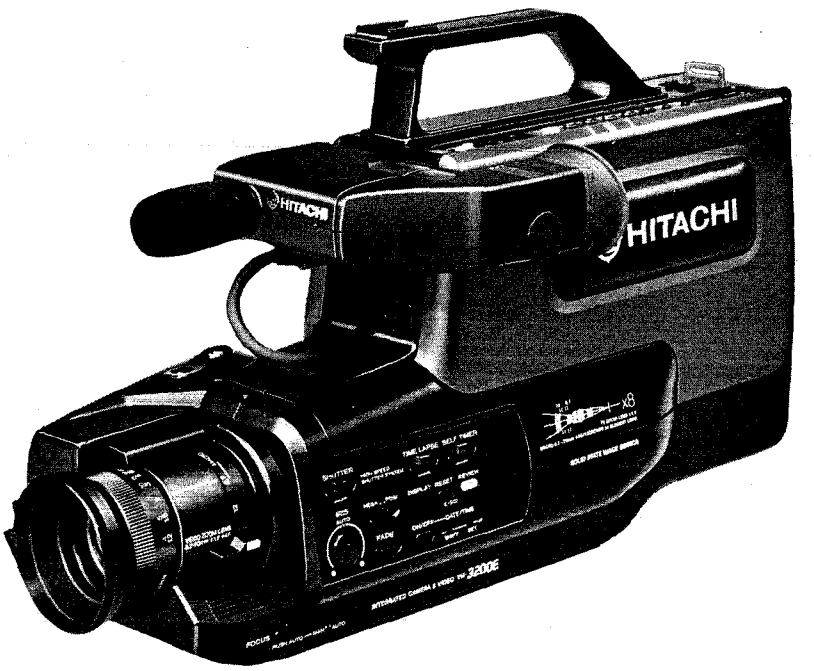
HITACHI

VIDEO CAMERA/RECORDER

VM-3200E



Instruction manual page 2
To obtain the best performance and ensure years of trouble-free use, please read this instruction manual completely.

Bedienungsanleitung Seite 30
Bitte lesen Sie diese Bedienungsanleitung aufmerksam durch, um durch richtige Bedienung jahrelangen und störungsfreien Betrieb zu gewährleisten.

Mode d'emploi page 58
Des performances optimales et un fonctionnement à long terme seront assurés en appliquant les présentes instructions après avoir entièrement lu ce mode d'emploi.

Gebruiksaanwijzing pagina 86
Lees deze gebruiksaanwijzing aandachtig door voor het verkrijgen van de beste prestaties en jarenlang probleemloos gebruik.

Bruksanvisning sidan 114
Läs denna bruksanvisning noggrant för att få ut det bästa ur apparaten och många års bekymmersfri användning.

Manuale di istruzioni pag. 142
Per garantire la migliore prestazione e la più lunga durata leggere attentamente e al completo le seguenti istruzioni.

Manual de instrucciones página 170
Para obtener el mejor funcionamiento y asegurar años de uso libre de problemas, lea cuidadosamente este manual de instrucciones.

VHS
PAL

FEATURES

Single-Unit Convenience and Ease of Operation
Your VM-3200E video camera/recorder combines the functions of a video camera and a video tape recorder in one lightweight, easy-to-use instrument. This eliminates interconnecting cables and simplifies operation.

Full Record and Playback Capability

Record — Your VM-3200E can record directly from the built-in video camera.

Playback — Video/audio played back by the VM-3200E video recorder or fed directly from the VM-3200E camera may be viewed and heard on a TV receiver/monitor by feeding the VM-3200E video/audio to the receiver/monitor inputs through the audio/video output cable. Additionally, the audio/video from the VM-3200E may be viewed and heard on a standard TV by using the RF converter unit (Optional accessory).

Standard VHS Cassettes Mean Interchangeability
Because the VM-3200E uses standard VHS video cassettes, tapes recorded on the VM-3200E may be played back by the VM-3200E or by any other VHS video tape recorder.

Auto Focus Power Zoom Lens
The 8:1 autofocus zoom lens uses an infrared beam to automatically maintain focus and to allow you to zoom in and out for close-ups or wide angle shots at just the touch of the zoom button. Macro feature permits use as close as 1 cm from the subject.

Automatic White Balance
Your Video Camera/Recorder will automatically maintain white balance as lighting conditions change.

Electronic Viewfinder (EVF)
The black-and-white electronic viewfinder allows you to see exactly what is being recorded. During playback operation, recorded material can be viewed on the electronic viewfinder.

High Speed Shutter
Use this feature to shoot tennis and golf shots that contain rapid movement. You can replay the still pictures at the crucial moments without any fluctuations.

HQ **The Video Camera/Recorder with this marking incorporates VHS high-quality picture technology and is compatible with any Video Camera/Recorder bearing the VHS mark.**

PRECAUTION

- **No water, dust or sand**
  Be careful that no water, dust or sand enters the Camera/Recorder because it may cause trouble and accidents.
- Do not leave the viewfinder lens facing sunlight for a prolonged period, or the phosphorescent surface of the cathode ray tube may be damaged.

Moisture condensation
"DEW" ("OPERATE") light indicates condensation on the recorder mechanism. If the camera/recorder is moved from a cold area to a warm area and the humidity is high, moisture can form on the metal surface of the recording mechanism. If this happens, the tape could be damaged. To prevent damage the camera/recorder will not operate except for EJECT. Should "DEW" ("OPERATE") light flash with the power on, press EJECT and remove the cassette. Wait for the moisture to dry (until "DEW" light stops flashing).

BE SURE NOT TO LEAVE IT IN A PLACE AT HIGH TEMPERATURE EXCEEDING 50°C, OR ITS INTERNAL PARTS MAY DETERIORATE. BE CAREFUL NOT TO LEAVE THE UNIT IN THE FOLLOWING PLACES:

- *** Inside a car with the window closed and in direct sunshine.**
- *** Near heating appliances.**
- *** In direct sunshine in summer.**

WARNING: It is permissible to record television programmes only in the event that third party copyrights and other rights are not violated.

MAINTENANCE

1. To maintain the optimum performance of this camera/recorder, regular periodic maintenance is required. Your dealer will advise you further.
2. Maintenance and adjustments may not be carried out by the user. In all cases of difficulty or doubt, consult your dealer.
3. Head cleaning
   - Dirt accumulated on the video heads after a period of time may cause the playback picture to become blurred or part of the video information to be lost. This does not mean that the recorded programme has been erased but head cleaning is required which must be carried out by your dealer.
   - Under no circumstances we do recommend users to attempt to clean the video heads as this is done only effectively by removal of the cover to gain access to the video heads and other parts which require cleaning, which would expose live conductors and present a "shock" hazard.
   - In regard to the various head cleaning tapes which are currently available on the market, these can cause damage and also reduce the operational life of the video heads if used incorrectly. Please consult your dealer as to the suitability of any cleaning aids before purchase.

SPECIFICATIONS

■ General

Power requirements	9.6V DC
Power consumption	9.5 watts (When AUTO/MAN FOCUS switch is "MAN".)
Dimensions	127(W) x 235(H) x 378(H) mm
Weight	2.4 kg

■ Video Recorder Section

Format	VHS
Record/playback system	2 video record/playback heads
Video signal	PAL colour & CCIR monochrome signals 625 lines
Tape speed	23.39 mm/sec.
Video output	1.0 Vp-p, 75 ohm
Mic input	−68 dBs, more than 1K ohm
Audio output	−8 dBs, less than 1K ohm
Earphone output	−26 dBs, (8 ohms terminal)
Fast forward/rewind time	Less than 8 minutes with E-180 cassette

■ Camera Section

Scanning	625 lines/50 fields/25 frames
Required minimum illumination	7 lux
Camera device	1/2" C.C.D
Lens diameter	46 mm

CAUTION FOR BATTERY PACK

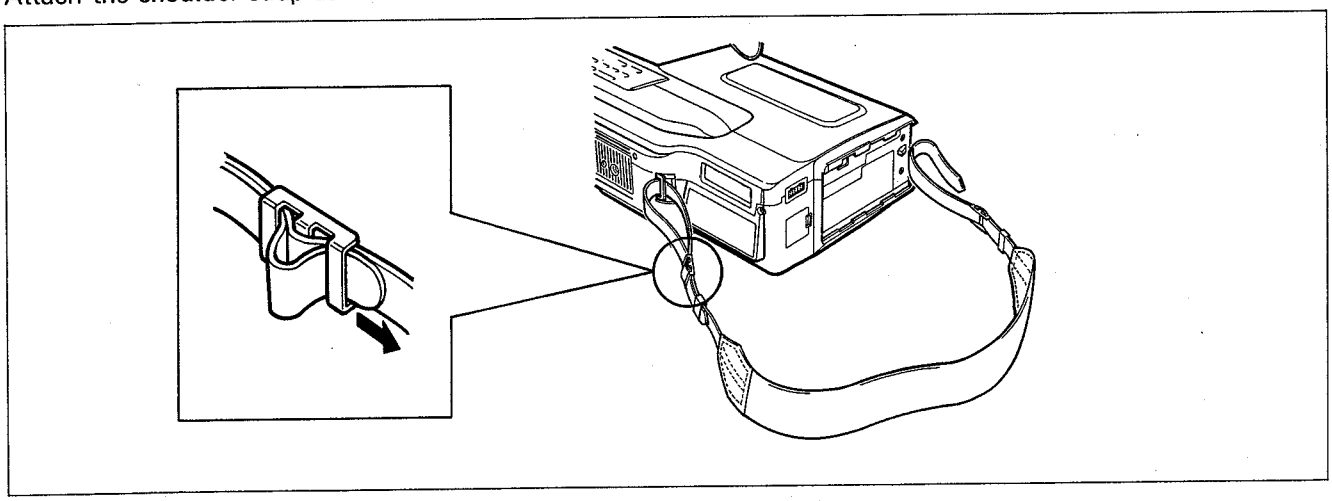
1. Recharge before each use.
2. Recharge in a place 0°C to 35°C.
3. Use specified charger only.
4. Do not put into fire.
5. Do not short-circuit battery.

TROUBLESHOOTING

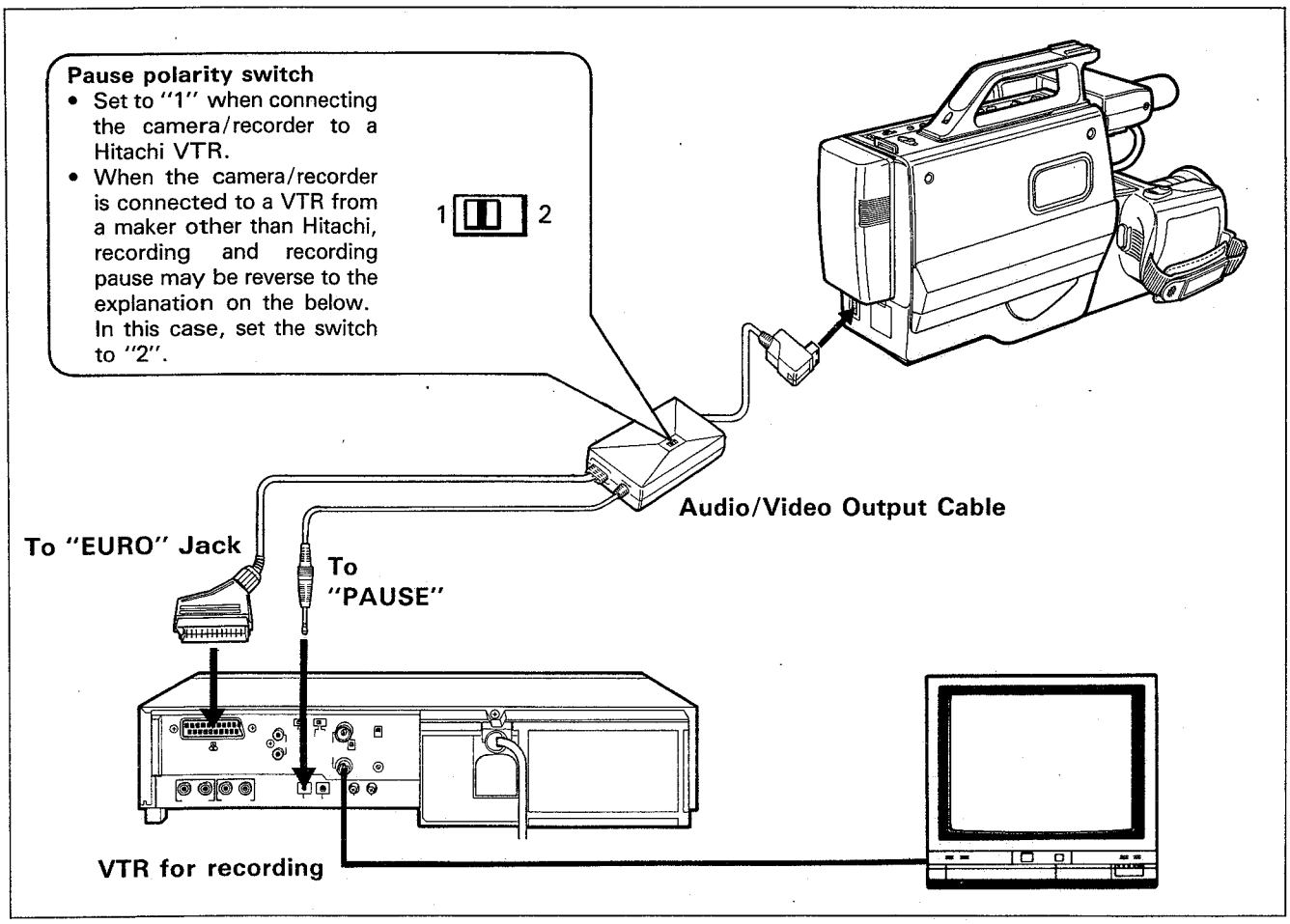
Symptom	Check Point & Correction
Cassette holder cannot be opened when you press EJECT button.	Connect the power source.
Cassette cannot be inserted into cassette compartment.	Load cassette in direction indicated by arrow on cassette.
Picture does not appear in the viewfinder.	Remove the lens cap.
	Press OPERATE switch on.
	Set VIDEO/CAM switch to "CAM".
The camera/recorder will not go into the recording mode, even when record start/stop button is pressed.	The cassette has had the erase prevention tab removed. Stick a piece of cellophane tape over the erase prevention hole or select a different cassette.
	Set VIDEO/CAM switch to "CAM".
	The "E" indication in the electronic viewfinder flashes to indicate battery is discharged. Try another battery or charge the battery.
PLAY button cannot be engaged.	Set VIDEO/CAM switch to "VIDEO".
Interference on playback picture.	Adjust TRACKING control.
	When you see the playback picture on your TV, adjust fine tuning knob on television set to obtain the best picture.
	The pre-recorded tape is LP recording. This camera/recorder is for use in SP recording only.
Picture is out of focus. Auto-focus does not operate.	Set AUTO/MAN FOCUS switch to "AUTO".
	The video camera/recorder is set to "MACRO" mode. Release the "MACRO" mode.

HOW TO INSTALL THE SHOULDER STRAP

Attach the shoulder strap as illustrated below.



CAMERA/RECORDER TO VTR DUBBING


Pause polarity switch
• Set to "1" when connecting the camera/recorder to a Hitachi VTR.
• When the camera/recorder is connected to a VTR from a maker other than Hitachi, recording and recording pause may be reverse to the explanation on the below. In this case, set the switch to "2".
1
2
Audio/Video Output Cable
To "EURO" Jack
To "PAUSE"
VTR for recording

1. Connect the camera/recorder, VTR and TV as shown in the figure, and then turn on their operate switches.
   - When connected to the pause jack of a VTR, the start and stop switching of the VTR can be controlled by pressing the buttons on the camera/recorder.
2. Insert the cassette used for editing into the camera/recorder and the cassette to be recorded into the VTR, then press RECORD button on the VTR.
   - The VTR will enter the record pause mode and recording will not start.
3. Press PLAY button of the camera/recorder and observe the TV picture. When you find the position at which you want to start editing, press STILL/REC/PAUSE button.
   - A still picture will appear on the TV screen.
4. Press STILL/REC/PAUSE button.
   - Playback will start. After a short interval, the VTR will start recording automatically.
5. Press STOP button when the tape reaches the position you want to cut.
   - Playback will stop and the VTR will enter the record pause mode automatically.
6. Fast forward or rewind the tape in the camera/recorder to locate the beginning of the next scene you want to edit.
7. Repeat steps 3 — 6 to cut out unnecessary scenes.
   - When the camera/recorder is set to the play•pause mode and STILL/REC/PAUSE button is pressed, it will start play, and with a short delay, the VTR will start recording automatically.
   - If, when the camera/recorder is playing, the STOP, F.FWD, REW or STILL/REC/PAUSE button is pressed, the VTR will enter the record pause mode.

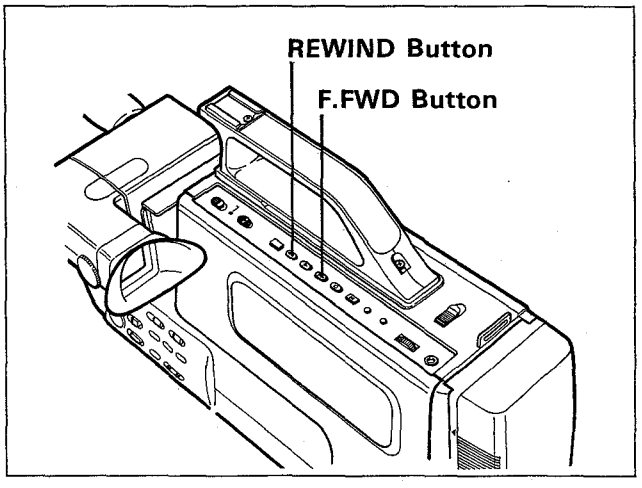
If the VTR for recording does not have a pause jack

- Recording start/stop of the VTR cannot be controlled by this unit.
- Operate the VTR to start recording simultaneously when you start playback of this unit.

USING THE F-SEARCH AND R-SEARCH FEATURES

When you press F.FWD or REWIND button during playback, the tape will be played back at a speed about 3 times faster than the normal playback speed, and you can easily locate a certain spot on the tape.

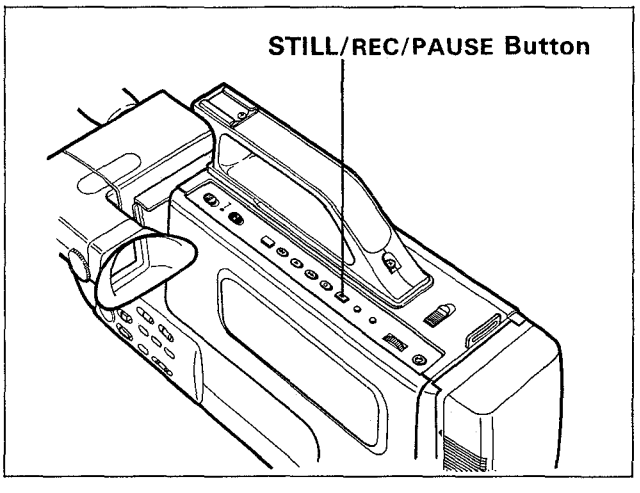
NOTE: There will be some noise (interference) in the F-search or R-search pictures.



USING THE STILL FEATURE

When STILL/REC/PAUSE button is pressed during playback, a still picture can be seen. To start again press STILL/REC/PAUSE button and playback will be resumed.

NOTE: There will be some noise (interference) in the still picture.



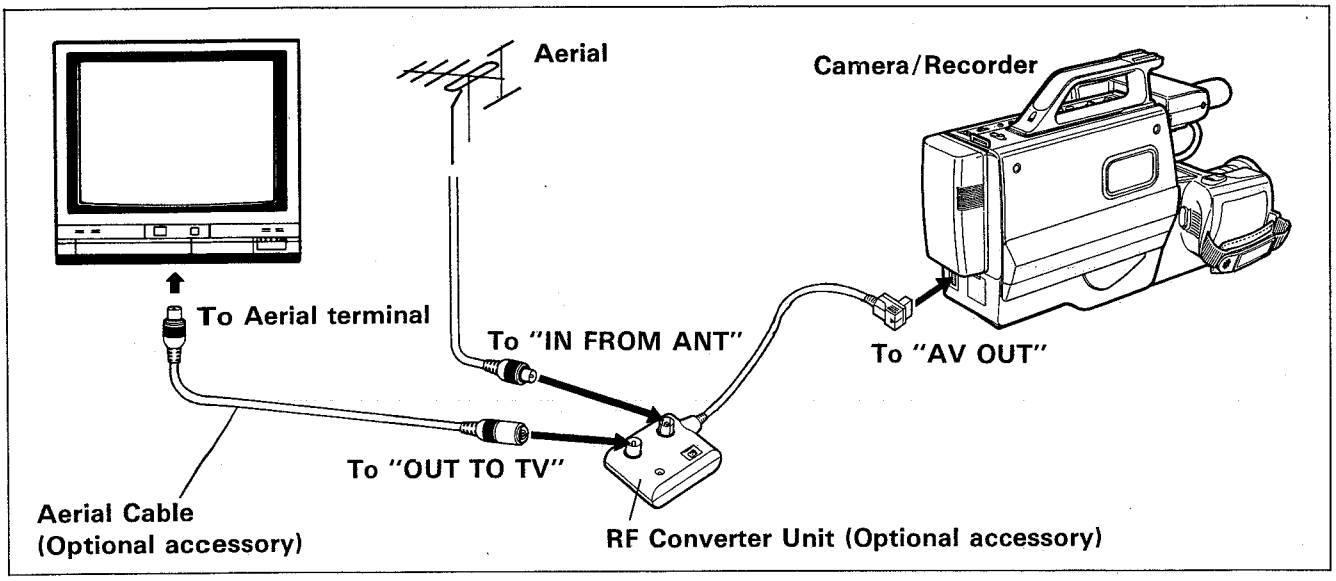
USING THE EDIT SEARCH FEATURE

Visual scanning can be performed while F.FWD or REW button is held depressed in the record/pause (stand-by) mode. And also when PLAY button is pressed in the record/pause mode, playback can be done while it is held depressed. Use this feature to search for the end of the previously recorded material in the record/pause mode when you are going to record a new program on the remaining blank section of the tape.

FLYING ERASE HEAD

A rotating erase head eliminates glitches and rainbow noise that occurs at the joints between recordings in previous models.

Example 3: If your TV is a regular TV,



1. Remove the antenna cable from your TV set. Connect this cable to "IN FROM ANT" on the RF converter unit.
2. Connect the Aerial cable to "OUT TO TV" on the RF converter unit.
3. Connect the other end to aerial terminal on your TV.
4. Connect the connector cable from RF converter unit to "AV OUT" on the camera/recorder.
5. Turn on the TV and select an unused channel (CH37). Refer to "VIDEO CHANNEL SETTING" below.
6. Perform same procedures in steps 4 through 8 of "Example 2" on page 23.

NOTE: If you want to watch a TV programme with camera/recorder connected as illustrated, slide OPERATE switch of the camera/recorder off, or disconnect the connector cable of RF converter unit from "AV OUT" jack on the camera/recorder.

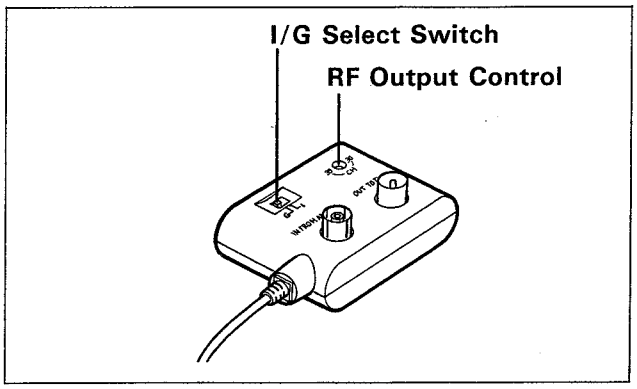
VIDEO CHANNEL SETTING

When viewing the picture played back by the camera/recorder on your TV, change over the I/G select switch of the RF converter unit matching your TV as well as to select the video channel on the TV.

1. Connect TV, RF converter unit and camera/recorder. (See above)
2. Set I/G select switch on RF converter unit as follows.

Colour TV broadcast system in your country	Position of I/G Select Switch
PAL (System I)	I
PAL (System B & G)	G

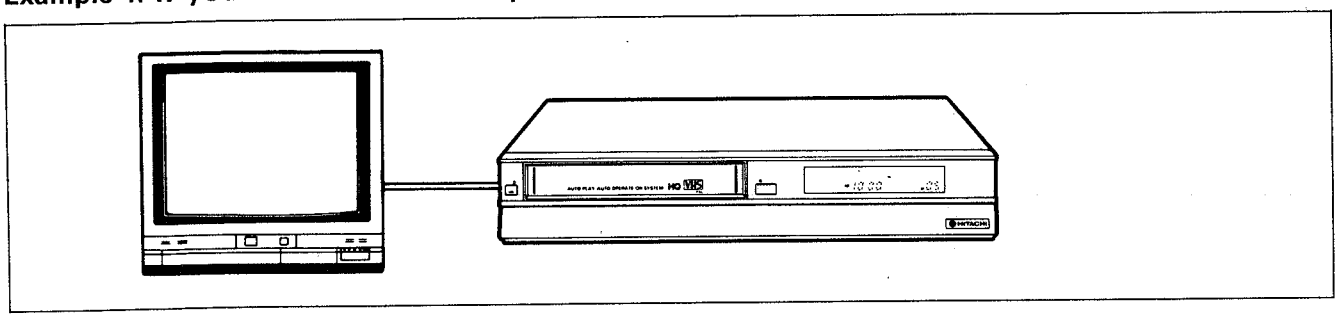
3. Turn on TV and select an unused channel (CH37). (In some cases this may be marked A/V.)
4. Insert the recorded tape to camera/recorder.
5. Turn on camera/recorder and set VIDEO/CAM select switch to "VIDEO".
6. Press PLAY button of camera/recorder.
   Now playback picture appears on your TV.
   If the playback picture is not clear or channel 37 is used for broadcasting in your area, adjust the RF output control of RF converter unit using a small screwdriver and readjust your TV until the playback picture is clearly observed.



CONNECTIONS AND OPERATIONS FOR VIEWING THE PICTURE PLAYED BACK ON YOUR TV

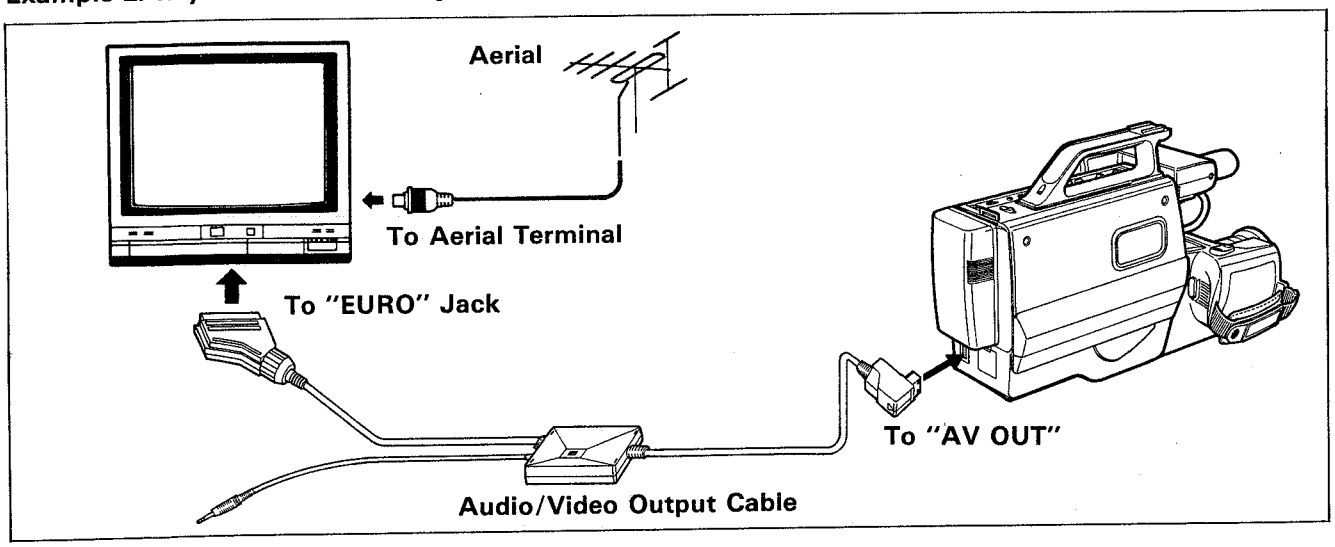
To play back a tape recorded on your camera/recorder and view it on your TV receiver, you must connect the camera/recorder to the TV receiver using either audio/video output cable or RF converter unit.
You also may play back the tape recorded by your camera/recorder on any other VHS video cassette recorder. The camera/recorder records and plays back in VHS standard speed (SP). The tape recorded in long play (LP) will not be played back on this camera/recorder.

Example 1: If you have a VHS video tape recorder



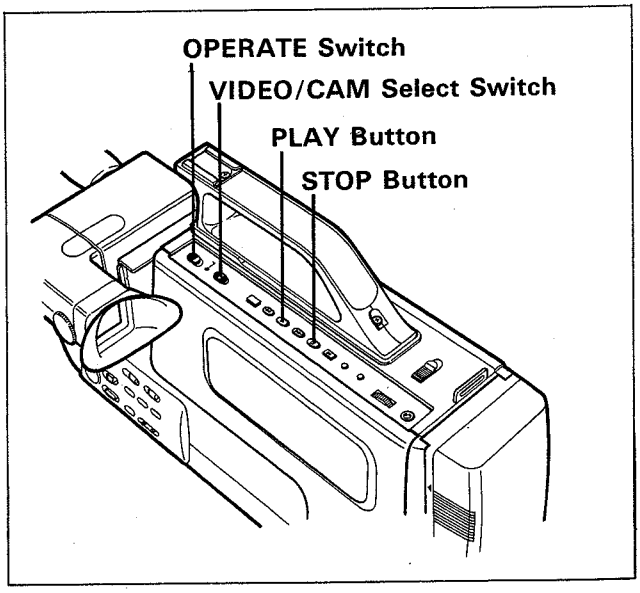
1. Insert the video cassette recorded by your camera/recorder into the VHS VTR.
2. Press PLAY button on the VTR.

Example 2: If your TV has EURO jacks,



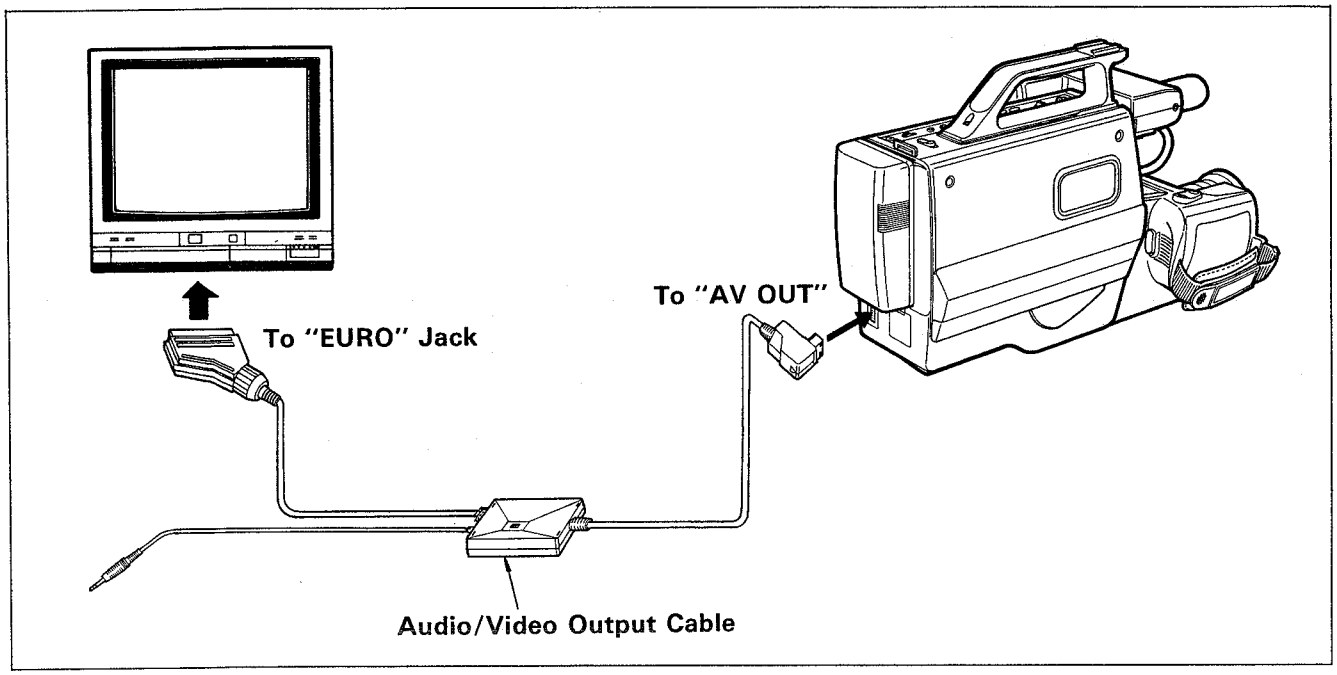
1. Connect the audio/video output cable to "EURO" jack of your TV.
2. Connect the other end of the audio/video output cable to "AV OUT" of your camera/recorder.

   NOTE: It is not necessary to connect the PAUSE plug (black).
3. Turn on TV and select video input.
4. Insert the cassette.
5. Set VIDEO/CAM select switch on camera/recorder to "VIDEO" position.
6. Press OPERATE switch to turn on camera/recorder.
7. Press PLAY button.
8. After playing press STOP button.



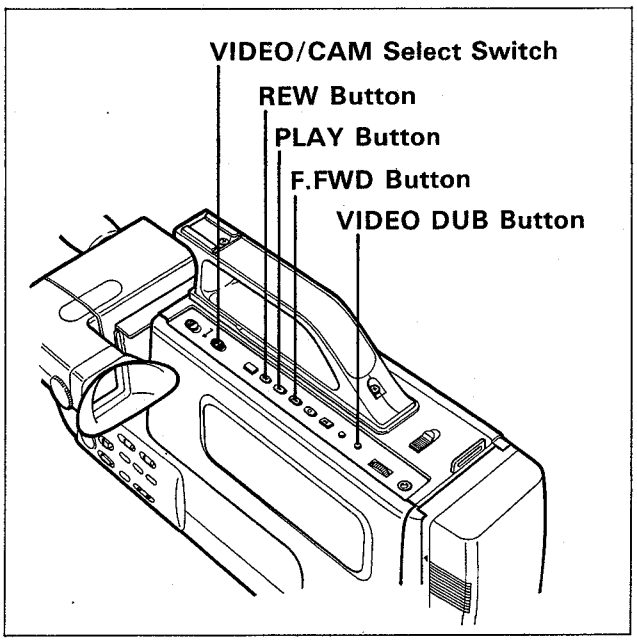
USING THE VIDEO DUBBING FEATURE

The video dubbing feature lets you record new pictures on a previous recorded tape without erasing the original audio (sound).
When you video dub a tape, the previous video is erased and replaced with the new pictures. In video dubbing, the source of the video dub is whatever you are seeing in the viewfinder.



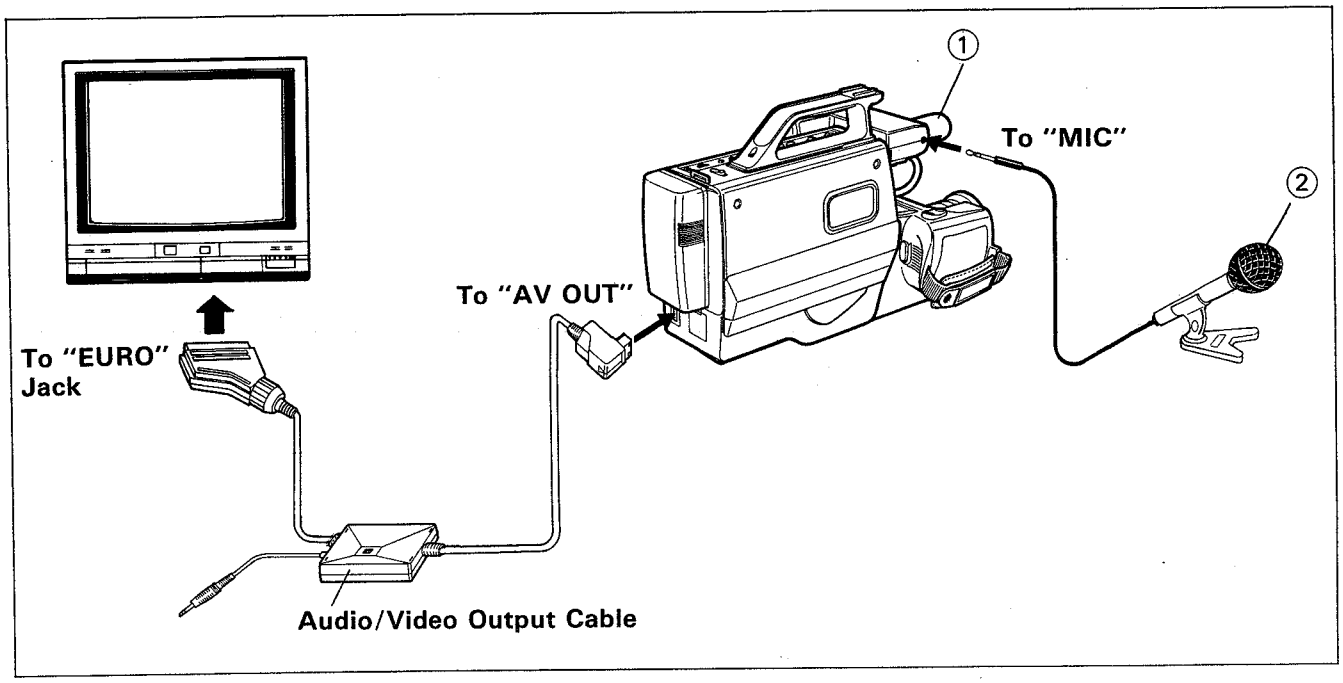
NOTES: • The picture shot by the camera/recorder can be dubbed.
• It is not necessary to connect the PAUSE plug (black).

1. Insert a recorded tape.
   Be sure that the record safety tab is not missing.
2. Slide VIDEO/CAM select switch to "VIDEO".
3. Press PLAY button and then REW or F.FWD button to search to the approximate position of the tape on which you want to dub a picture.
4. Press PLAY button again to search the exact position where you stop dubbing and then press STILL/REC/PAUSE button.
5. Press DISPLAY button so counter memory "M" appears and then press RESET/E-240 button to set the counter reading to "0000".
6. Press REW button to rewind the tape to the approximate position from which you want to start dubbing.
7. Press PLAY button, and when the exact position from which you start to dub is reached, press STILL/REC/PAUSE button.
8. Press VIDEO DUB and PLAY buttons simultaneously. "V.DUB" is displayed in the viewfinder, and at the same time the picture to be dubbed appears.
9. Press STILL/REC/PAUSE button.
   Video dubbing will start and will stop when the counter reads "0000".



USING THE AUDIO DUBBING FEATURE

The audio dubbing feature lets you record new audio (sound) on a previous recorded tape without erasing the original video (picture).
When you audio dub a tape, the previous audio is erased and replaced with new sound.

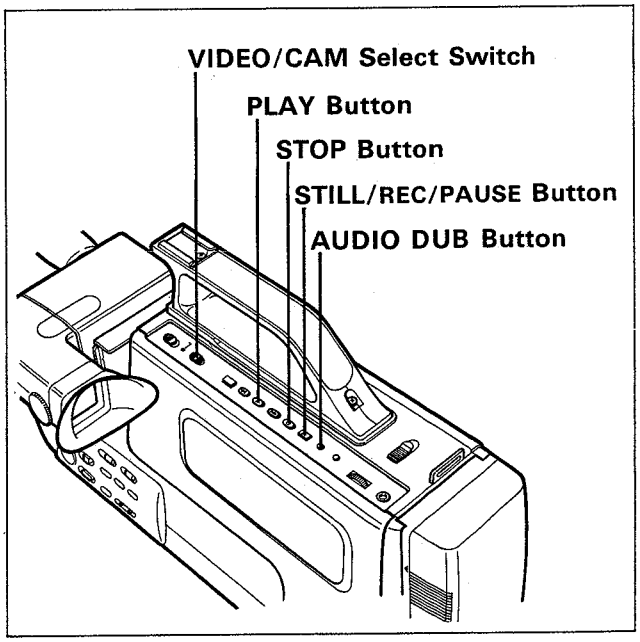


NOTES:
- Sound from the built-in microphone and external microphone can be dubbed.
- Do not connect an external microphone when dubbing audio from the built-in microphone. Connecting an external microphone switches off the built-in microphone automatically.
- It is not necessary to connect the PAUSE plug (black).

1. Insert a recorded tape.
   Be sure that the record safety tab is not missing.
2. Slide VIDEO/CAM select switch to "VIDEO".
3. Play the tape and press STILL/REC/PAUSE button where you want to dub audio.
   - The camera/recorder enters the still play mode.
4. Press AUDIO DUB and PLAY buttons at the same time.
   - "A.DUB" appears in the viewfinder.
5. Press STILL/REC/PAUSE button to start audio dubbing.
6. Press STOP button to stop audio dubbing.

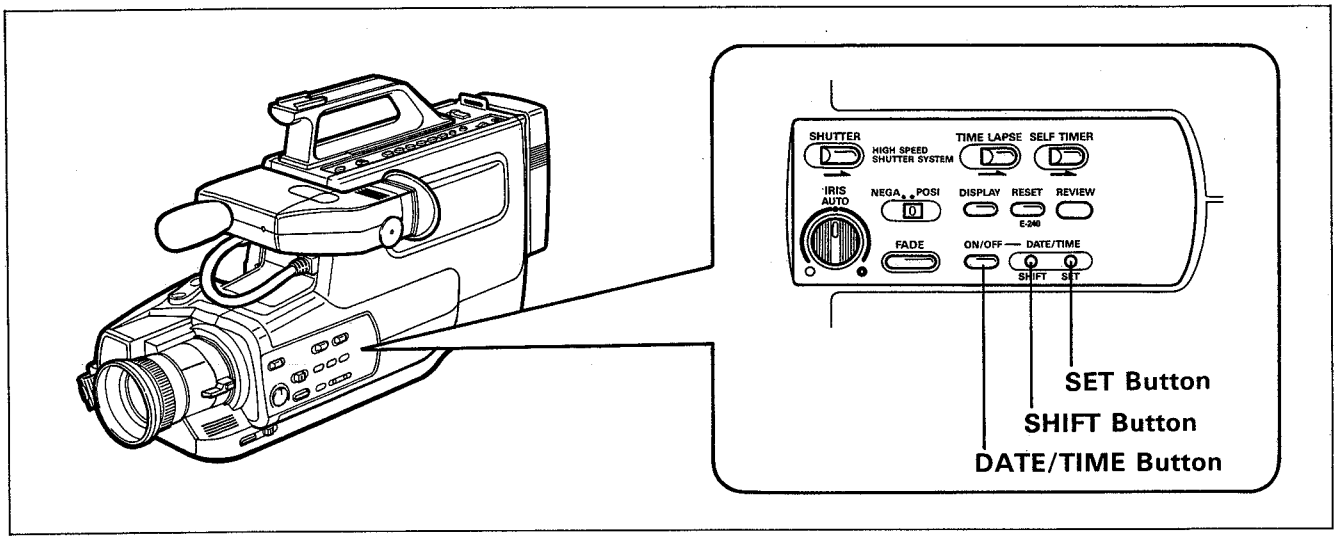
NOTE: If counter memory "M" appears in the viewfinder, the tape stops automatically at the reading of "0000" and audio dubbing stops.

NOTE: You can also dub both the video and audio simultaneously if desired. To do so, press AUDIO DUB and PLAY buttons first, then press VIDEO DUB and PLAY buttons in step 4 above.

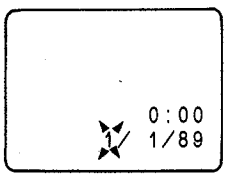


DATE/CLOCK SETTING

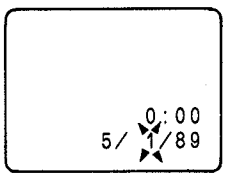
The date and clock can be recorded on your tapes to act as a handy reference when viewing them at a later time. Use the following procedure to set up this display for the current date and time.



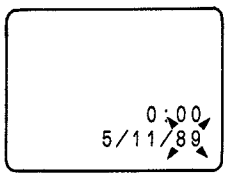
1. Load the camera/recorder's date/clock battery as described on page 8.
2. Turn on power of camera/recorder.
3. Slide VIDEO/CAM select switch to "CAM".
4. Press DATE/TIME button.
   "0:00" and "1/1/89" appears in the viewfinder and "1" flashes.



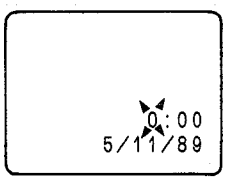
5. Press SET button to select correct date. Hold button down to advance rapidly. When the correct date appears, press SHIFT button.



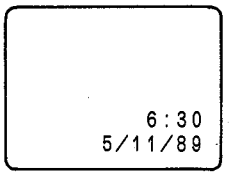
6. Press SET button to select correct month. Hold button down to advance rapidly. When the correct month appears, press SHIFT button.



7. Press SET button to select year, and then press SHIFT button.



8. Press SET button to select correct hour, and then press SHIFT button.
9. Press SET button to select correct minute.



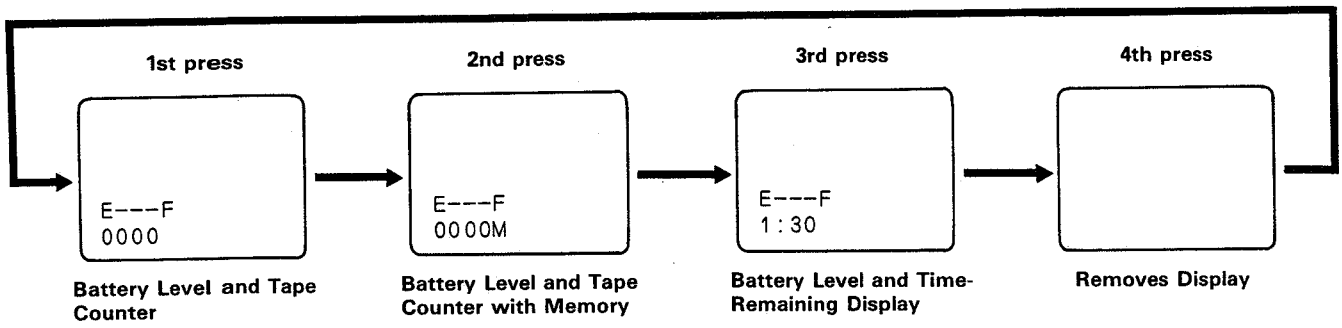
10. After setting correct minute, press SHIFT button again to erase the flashing cursor and start the internal clock.

NOTES:

- To correct date/clock information during programming or after starting the date/clock, press SHIFT button until the incorrect digit is flashing. Then use SET button to enter the correct digit.
- The date/clock graphics will be recorded whenever they appear in the viewfinder. To display date and clock together, press DATE/TIME button. To display date only, press DATE/TIME button again. Pressing DATE/TIME button a third time removes both graphics.

USING THE DISPLAY BUTTON

Pressing the DISPLAY button lets you check several special displays in the viewfinder.

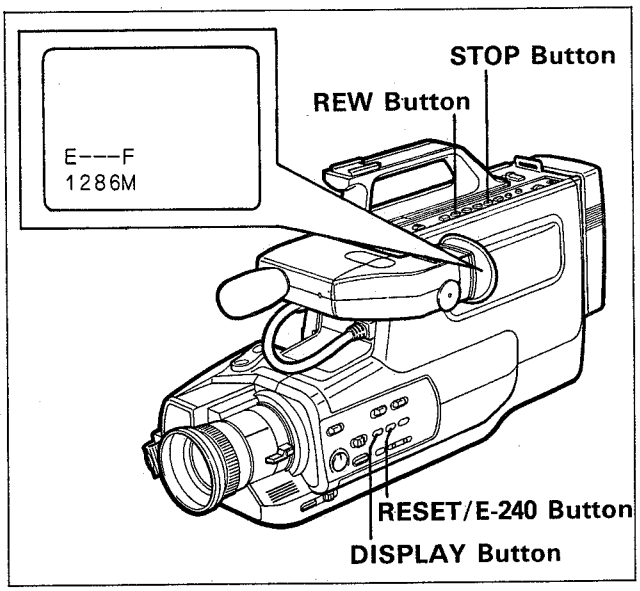


USING THE MEMORY FEATURE

When the tape counter with memory indication appears in the viewfinder, a tape that is being rewound automatically stops when the counter reads approximately "0000". This is useful if there is a section of tape you want to review immediately after recording or if you want to return to the same point several times in a row.

1. Press DISPLAY button until the tape counter with memory is displayed.
2. Start playing or recording a tape.
3. At the point you want playback to start, press RESET/E-240 button to reset the counter to "0000".
4. Continue to play or record.
5. Press STOP button.
6. Press REW button. The tape will be rewound to the preselected point, at approximately "0000" indication.

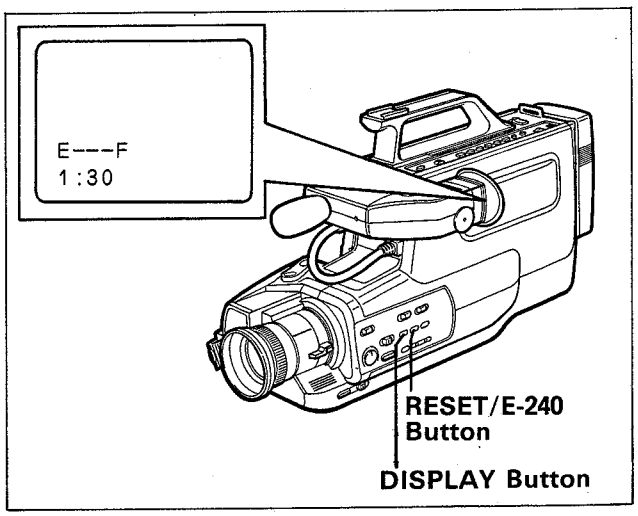
NOTE: The tape will also stop approximately at "0000" during fast forward mode.



USING THE TIME REMAINING FEATURE

When the tape counter with memory is present in the viewfinder, pressing DISPLAY button again will change the display to a read-out showing the amount of recording or playback time left on the tape. Pressing DISPLAY button once more clears all graphics from the viewfinder.

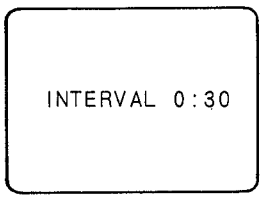
NOTE: When using an extended length E-240 cassette, you must press RESET/E-240 button to adapt the camera/recorder's time remaining system for an accurate read-out. (If the counter is being displayed, RESET/E-240 button resets the counter to "0000".)



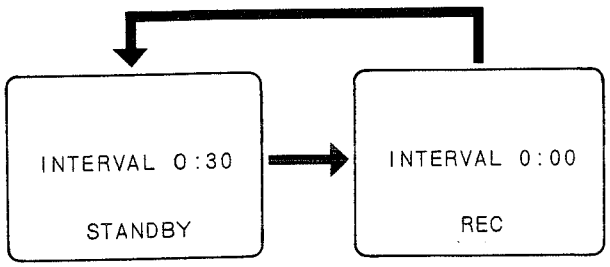
USING THE TIME-LAPSE RECORDING FEATURE

This function is convenient to record the blooming of flowers, etc. as it starts and stops recording at a predetermined interval.
For example, this function allows recording for one second after a pause of 30 seconds and repeats this procedure.

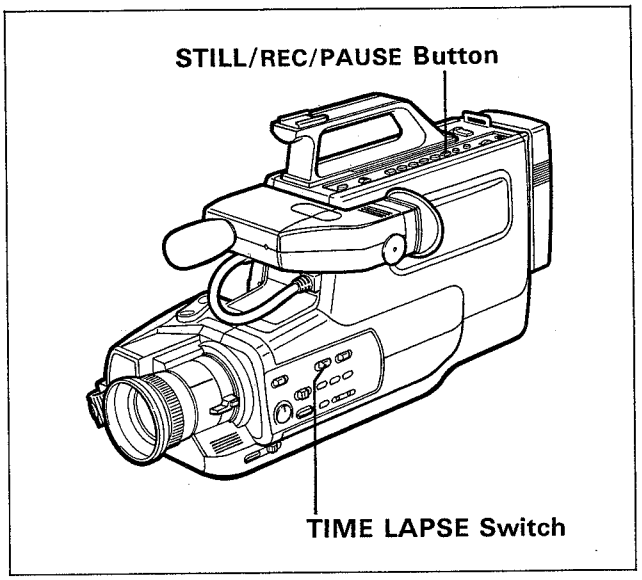
1. In the record/pause (stand-by) mode, press TIME LAPSE switch repeatedly until the length of time you want between recordings appears in the viewfinder.
   - The interval is changed from 0:30 (30 seconds) to 1:00 (1 minute), 2:00 (2 minutes), 5:00 (5 minutes), MAN (manual) and again to 0:30 every time the button is pressed.



2. Press the record start/stop or STILL/REC/PAUSE button.



   - The clock starts counting, and when it reaches "0:00", a recording is performed for a second, and then the record/pause (stand-by) mode is entered. After 30 seconds, recording is repeated for another second.
3. Press the record start/stop button to stop recording.



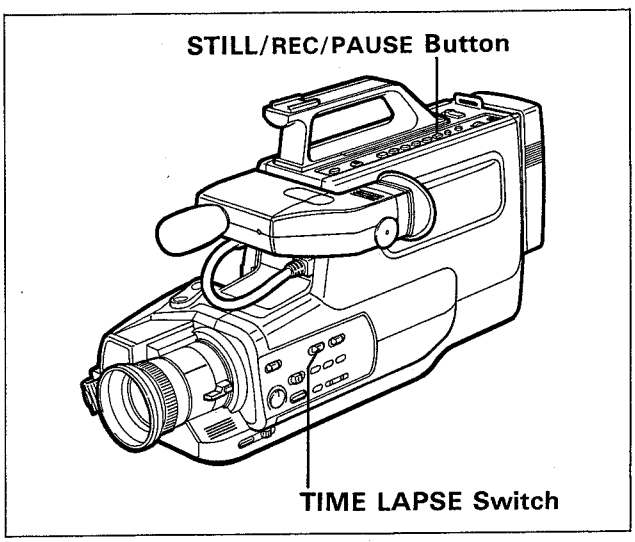
NOTES:

- Do not continue to time-lapse record for more than 48 hours.
- The interval time can be changed any time (even during time-lapse recording) by pressing the TIME LAPSE switch.
- If "MAN" is selected for the interval time, one shot recording can be done. See below for operations.
- When tapes recorded using the time-lapse and one shot recording features are played back, pictures may be distorted or colour may disappear with some TVs, however, this does not indicate a fault.

USING THE ONE SHOT RECORDING FEATURE

This function is convenient to produce an animated video.
One shot (a few frames) each is recorded every time the record start/stop button is pressed. Shoot a doll, etc. while moving it slightly between shots to produce an animated video of your own.

1. In the record/pause (stand-by) mode, press TIME LAPSE switch repeatedly to select "INTERVAL MAN".
2. Press the record start/stop or STILL/REC/PAUSE button.
   - One shot (a few frames) is recorded every time the button is slid.
3. Press the TIME LAPSE switch so that INTERVAL MAN disappears to stop recording.



USING THE SELF TIMER FEATURE

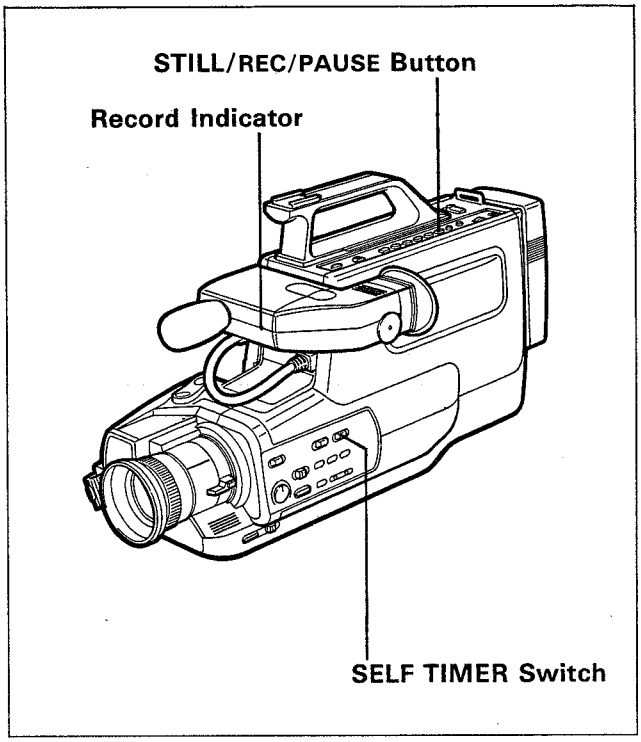
The self timer allows you to automatically start recording after about ten seconds.

Press SELF TIMER switch once while in the record/pause mode.
The camera/recorder will automatically start recording after ten seconds when the switch is pressed and will continue to record for approx. 30 seconds.

If you press the SELF TIMER switch twice, the camera/recorder will automatically start recording after ten seconds when the switch is pressed and then recording will continue until the record start/stop button or STILL/REC/PAUSE button is pressed.

NOTES:

- Record indicator flashes for about 10 seconds to indicate self timer mode when you press SELF TIMER switch and stays on during recording.
- Pressing SELF TIMER switch a third time before recording starts releases the self timer mode.
- To stop the camera/recorder during self timer recording, press record start/stop button or STILL/REC/PAUSE button and the camera/recorder will enter the record/pause (stand-by) mode.
- The SELF TIMER switch has no effect during normal recording.



USING THE FADE-IN/FADE-OUT FEATURE

This feature lets you add a professional touch to your home recordings. When you fade into a scene, the recording will start with a blank scene and the picture will gradually appear. The picture gradually disappears when fading out.

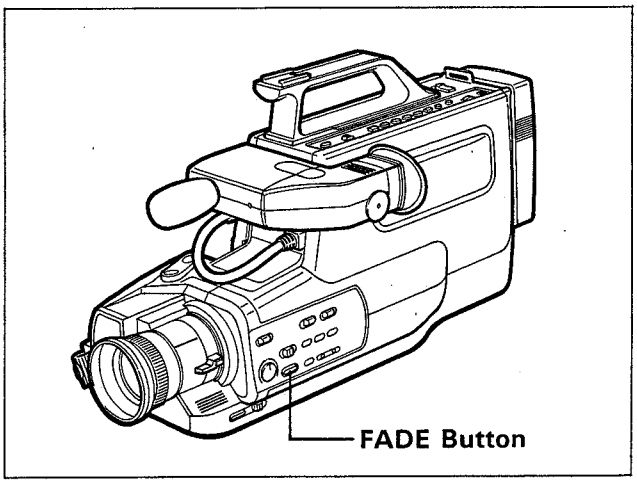
■ FADE-IN

1. While the camera/recorder is in the record/pause mode, press and hold FADE button.
2. Press record start/stop button to start recording.
3. Release FADE button after a few seconds. The picture will gradually appear on a blank screen.

■ FADE-OUT

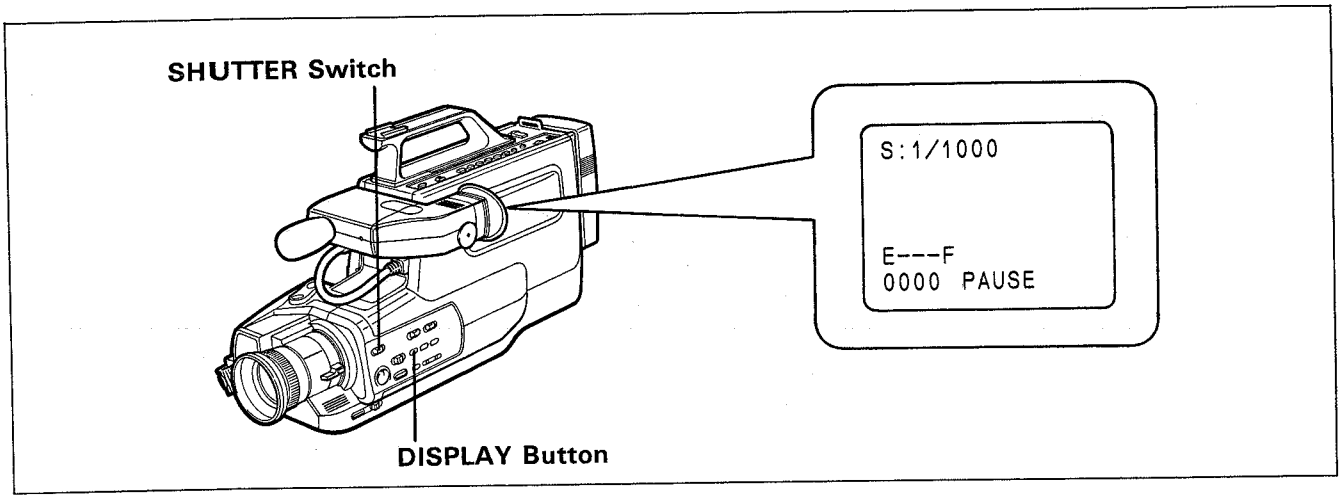
1. While the camera/recorder is recording, press and hold FADE button. The picture will graudally disappear from the screen.
2. Continue to hold FADE button, and press record start/stop button to stop recording.
3. After the recording has stopped, release FADE button. The picture will reappear in the viewfinder.

NOTE: When using FADE button, both picture and sound will gradually appear and disappear. The fade speed is automatically controlled by the camera/recorder.



USING THE SHUTTER SPEED CONTROL FEATURE

Use this feature to shoot tennis and golf shots that contain rapid movement. You can replay the still pictures at the crucial moments without any fluctuations.
Normally the shutter speed is 1/50 seconds. The speed can be changed up to 1/1000 seconds or 1/500 seconds.



1. In record/pause (stand-by) or record mode, press DISPLAY button to display battery level indicator in the viewfinder.
2. Press SHUTTER switch once or twice. The shutter speed will change 1/500 to 1/1000 and then back to 1/50 seconds. The shutter speed is displayed in the viewfinder.
   For example, the speed is 1/1000 seconds, "S:1/1000" will be displayed.

   NOTE: When the shutter speed is 1/50 seconds, "S:1/50" will not be displayed in the viewfinder.
3. Press record start/stop or STILL/REC/PAUSE button to start recording.

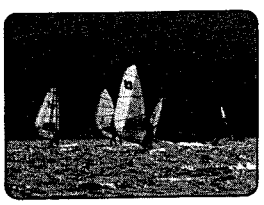
NOTES:

- After use, press the SHUTTER switch so that display of 1/500 or 1/1000 will disappear.
- When shooting at the 1/1000 speed, more light is required because the pictures become darker than the normal shooting at 1/50 speed. When there is insufficient light, the speed indication flashes to warn you.
- When a tape that was recorded using the high speed shutter feature is played back, scenes changes will not be seen as a smooth motion.
- When the camera is pointed at an object that is moving rapidly, it may not be focused in the auto focus mode. In this case, focus manually.

USING THE NEGATIVE/POSITIVE INVERSION FEATURE

You can record a subject while inverting the colors and black/white as in a nagative film.

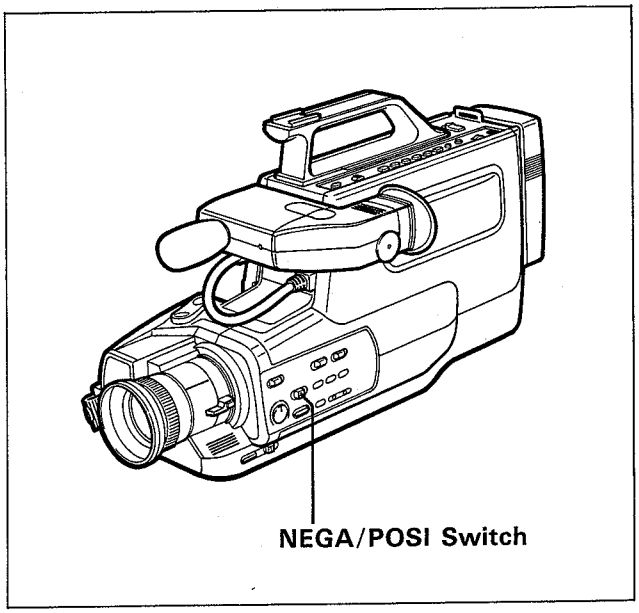
- Normally set to "POSI".
- Set to "NEGA" for special effects.



Positive picture

Negative picture

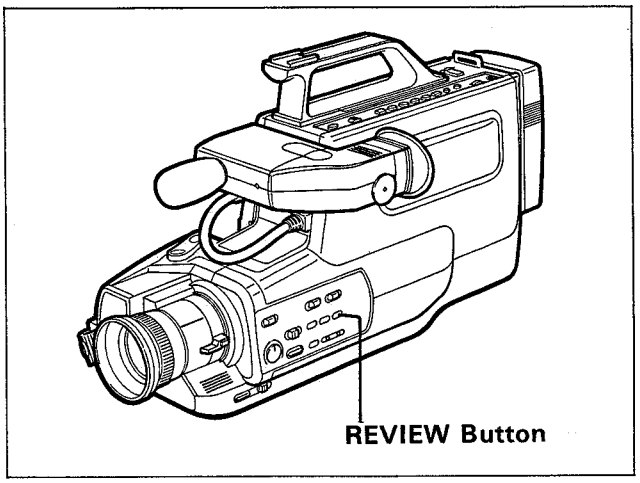
NOTE: Always return the switch to "POSI" after shooting with the switch set to "NEGA".



USING THE INSTANT REVIEW FEATURE

1. In record/pause (stand by) mode, press REVIEW button, and the recorded scene of the last few seconds is played back in the reverse direction and then played back in the forward direction.
2. When the tape reaches the end of the scene you have just recorded, the camera/recorder returns to the record/pause (stand by) mode.
   Recording starts again when the record start/stop button is pressed again.

NOTE: Sound is muted in the instant review mode.



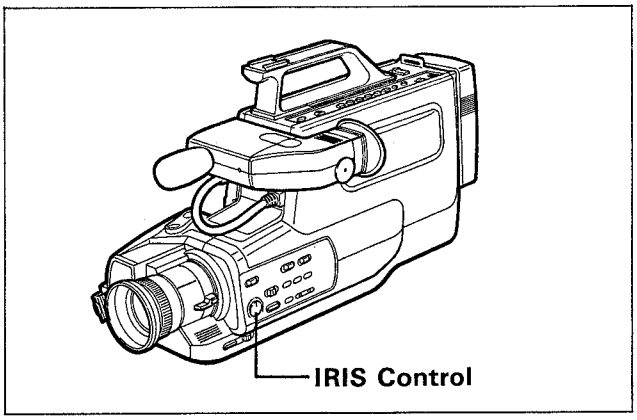
USING THE AUTO IRIS FEATURE

This camera/recorder is provided with an auto iris mechanism which automatically adjusts the lens aperture in accordance with the incident light when the IRIS control is placed in "AUTO" position. When the object is dark, the iris opens automatically, and it closes when the object is bright. When the power is switched off, the iris is automatically set to the fully closed position.

■ To manually adjust the iris

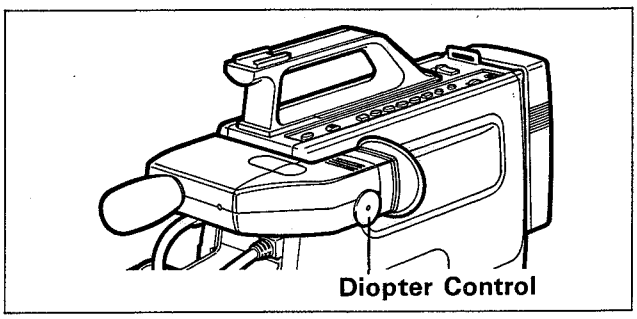
You can also adjust the iris manually.

- When the object is in bright light and the background is dark, adjust the IRIS control counterclockwise to narrow the iris opening.
- When the background is in bright light and the object appears to be too dark, adjust IRIS control clockwise to widen the iris opening.



EYEPIECE ADJUSTMENT

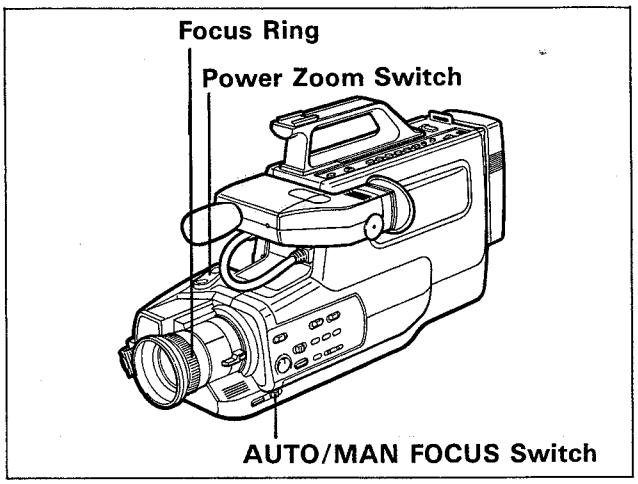
To use the electronic viewfinder without eyeglasses on, adjust the diopter control for optimum focus adjustment.

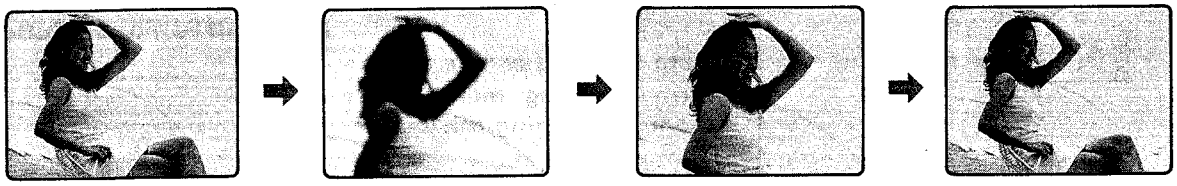


■ MANUAL FOCUSING

1. Set AUTO/MAN FOCUS switch to "MAN" position.
2. Zoom in on the object by pressing the power zoom switch on the "T" side.
3. Focus on the object by turning the focus ring.

   NOTE: If focusing is performed without zooming up first, the picture may become out of focus when the zoom-up is done during actual picture taking.
4. Then, zoom back the object as desired.



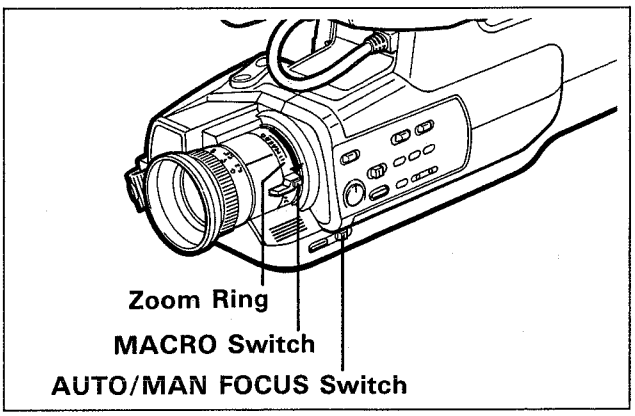


Far Object → Zoom Up → Focused → Zoom Back

■ MACRO FOCUS

It permits you to shoot objects as close as 1 cm from the lens tip.

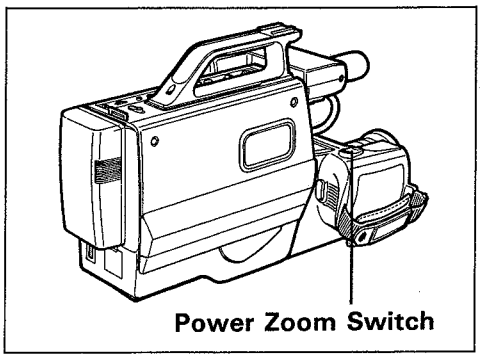
1. Set AUTO/MAN FOCUS switch to "MAN" position.
2. Turn the zoom lever to "MACRO" while pressing MACRO switch.
3. Turn the zoom ring within the "MACRO" range (green line on the zoom ring) for focusing.



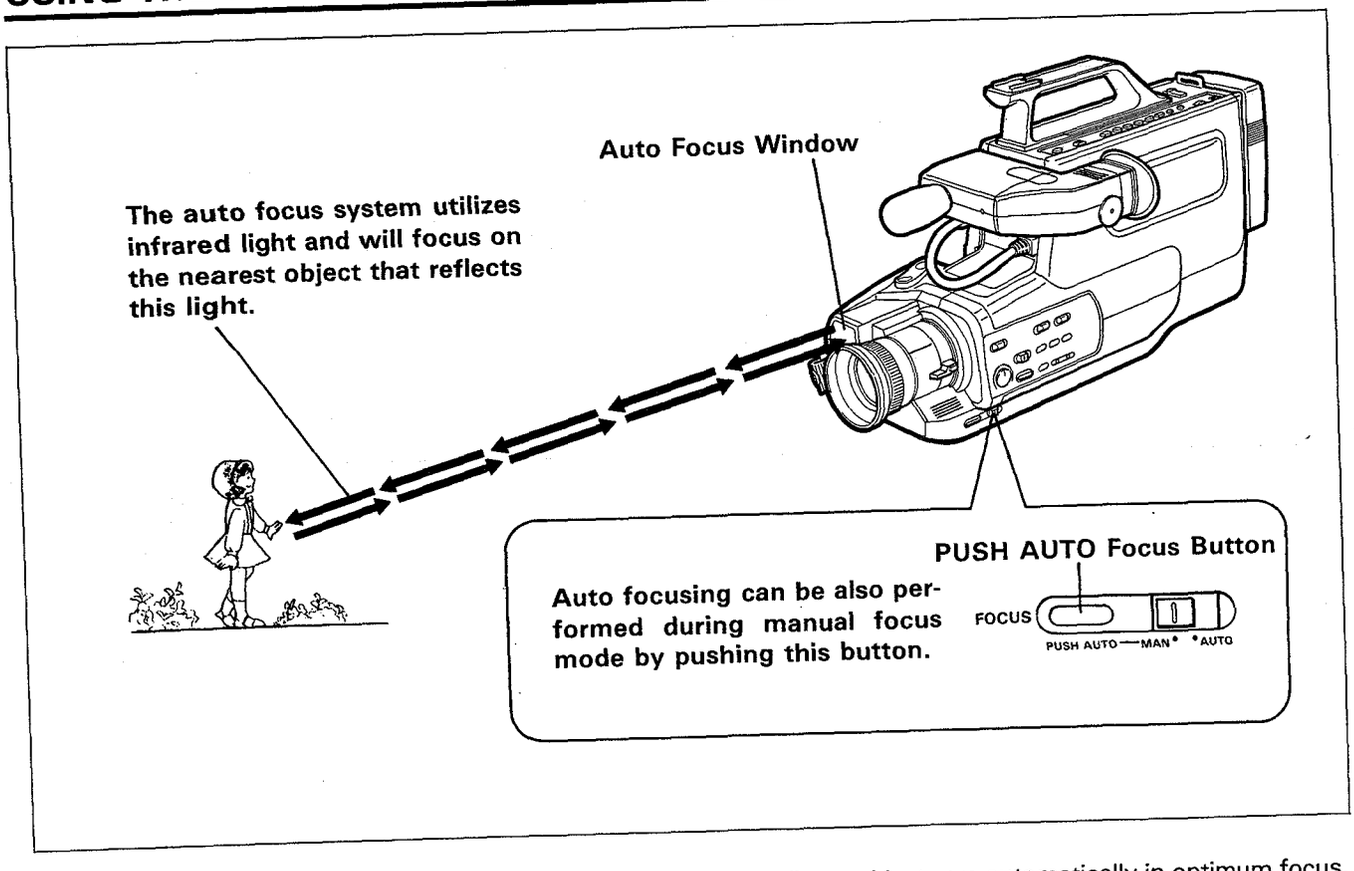
USING THE POWER ZOOM FEATURE

- Press power zoom switch on the "W" side, and the picture gradually widens.

- Press power zoom switch on the "T" side, and the picture gradually becomes telescopic.



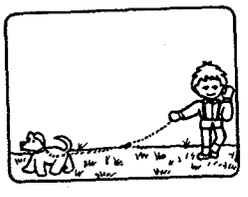
USING THE AUTO FOCUS FEATURE


Auto Focus Window
The auto focus system utilizes infrared light and will focus on the nearest object that reflects this light.
PUSH AUTO Focus Button
Auto focusing can be also performed during manual focus mode by pushing this button.
FOCUS
PUSH AUTO—MAN*
*AUTO

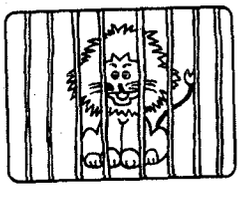
With the AUTO/MAN FOCUS switch set to "AUTO" position, ordinary objects are automatically in optimum focus.

■ OBJECTS HARD TO AUTO FOCUS

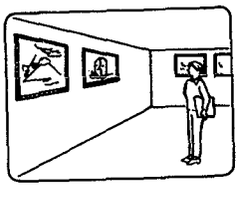
The distance between the auto focus window and the object is measured, and the focus ring is automatically turned for focusing. However, with the scenes such as shown below, the auto focusing may not operate properly. Then, perform the manual focus. See next page.



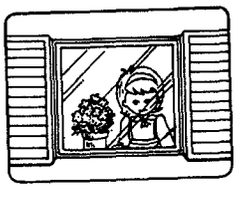
1. Object is not in the center.



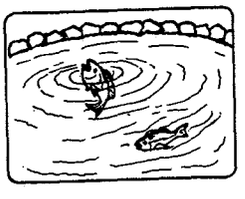
2. Objects in far and near positions at the same time.



3. Object with continuous variation from far to near positions.

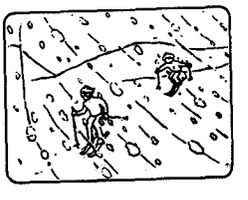


4. Object behind glass.

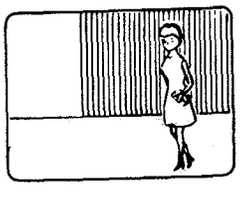


5. Black object or water which are hard to reflect infrared light.

6. Object always moving such as a crowd.

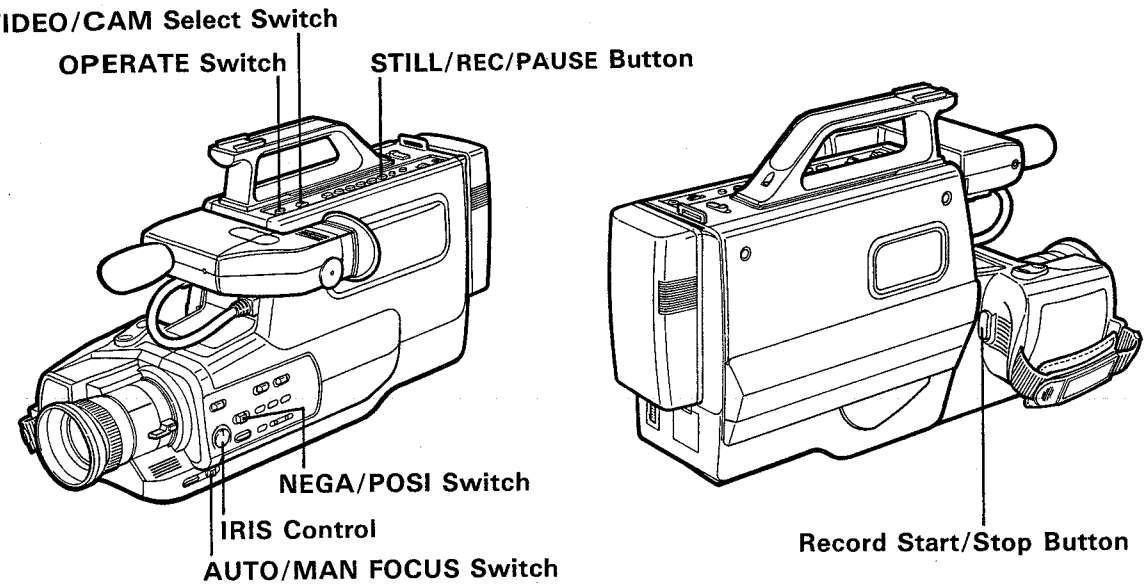


7. Object in the snow or fog.



8. Objects with equal pitches.

CAMERA RECORDING



1. Connect either one of the "POWER SOURCES" on pages 9 and 10.
2. Insert the cassette so the transparent window is toward you and the arrow toward the cassette holder.
3. Set VIDEO/CAM select switch to "CAM" position.
4. Press OPERATE switch to turn on camera/recorder. The camera/recorder will enter record/pause mode automatically.

   NOTE: If the erase prevention tab on the cassette is removed or no cassette is inserted, the "TAPE" indication in the viewfinder flashes for several seconds and the camera/recorder will not enter record/pause mode.
5. Set IRIS control to "AUTO".
6. Set AUTO/MAN FOCUS switch to "AUTO".
7. Set NEGA/POSI switch to "POSI".
8. Now, press record start/stop button of handgrip or STILL/REC/PAUSE button to start shooting the picture. You are now recording the picture you see through the electronic viewfinder. The "REC" indication in the electronic viewfinder will appear.
9. Press record start/stop button or STILL/REC/PAUSE button to stop recording. Press the button again to resume recording. The "REC" indication in the electronic viewfinder goes off in the record/pause (stand-by) mode.
10. After recording, set VIDEO/CAM select switch to "VIDEO", and the camera/recorder will be now in the stop mode.
11. Press OPERATE switch off and then EJECT button to remove cassette.
12. Always remove the power source from the video camera/recorder after use.

NOTE: If you have a cassette tape that has already been partially recorded on and you want to record the remaining blank section, see "USING THE EDIT SEARCH FEATURE" on page 25.

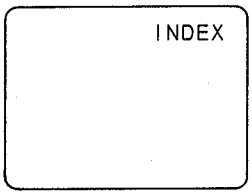
■ INDEX SIGNAL RECORDING

Indexing your tapes while recording makes it easy to find desired program segments when you play back the tape in a VTR that has a compatible indexing feature called the "VHS Index Search System". See your VTR's instruction manual for index playback instructions.

"INDEX" signals are recorded automatically when the following operations are performed.

- When power is turned on about 4 hours after it is switched off and then recording is started.
- When power is turned on after the date is changed to the next day with the power off and then recording is started.

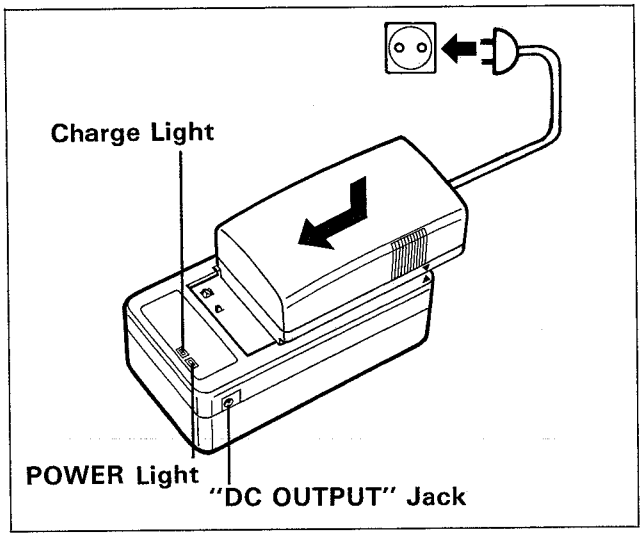
NOTE: "INDEX" is displayed in the viewfinder, and when an "INDEX" signal is recorded, "INDEX" disappears.



CHARGING THE BATTERY PACK

1. Plug the AC adaptor/charger power cord into AC electrical outlet.
2. Attach the battery to the AC adaptor/charger. Align the reference arrow on the battery with that of AC adaptor/charger and push the battery flush with the AC adaptor/charger and slide it in the direction of arrow.

   NOTE: You must remove the DC cord from the AC adaptor/charger to charge the battery. If the DC cord is connected, charge light will flash.
3. The charge light will be lighted while the battery is accepting a charge, and will go out when the battery is fully charged.



NOTES:

1. The time required for charging the battery is approx. one hour.
2. An optional long play battery (VM-BP63) may also be charged by the AC adaptor/charger. The time for battery charging is approx. two hours.
3. Charging is not possible when a DC cord is connected to the DC output jack.
4. When a battery, which has become very hot, is attached to the AC adaptor/charger the "POWER" light of the AC adaptor/charger flashes. In this event unplug the AC adaptor/charger from the AC outlet for approximately ten seconds. After that period the power cord may be plugged back into the AC outlet. Attaching an extremely hot battery to the AC adaptor/charger is not recommended; it should be allowed to cool down before being attached.

NOTES:

- A battery pack will discharge on its own and its capacity will be reduced even if it is left unused. Be sure to charge before using it.
- When the camera/recorder is turned on, the capacity of the battery pack will be reduced even if the camera/recorder is not recording. Turn off the camera/recorder when not using it.
- If the record pause mode is used too often or the battery is used at low temperatures, the time for which the battery can be used will be shortened.

INSERTION AND REMOVAL OF CASSETTE

Before inserting or removing a cassette, be sure to connect the power source.

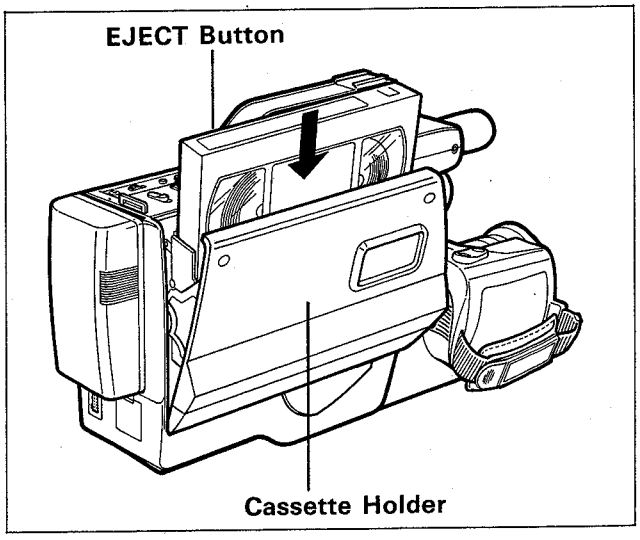
■ Insertion

1. Press EJECT button and insert the cassette so the transparent window is toward you and the arrow toward the cassette holder. Slide the cassette into cassette holder as far as it will go.

   NOTE: If the power source is not connected to camera/recorder, the cassette holder will not open.
2. Press the cassette holder. The holder will latch in the operating position.

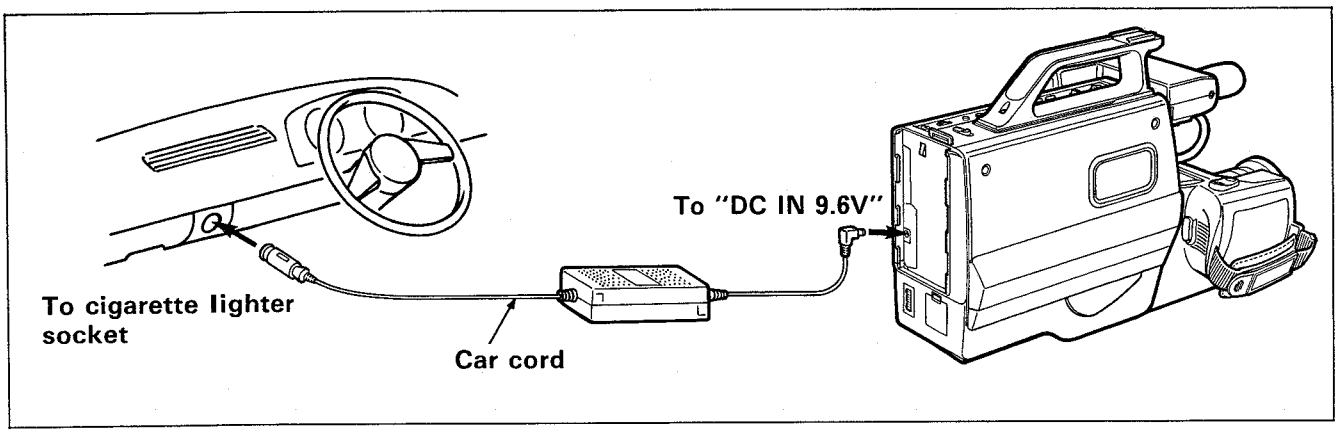
■ Removal

1. Press EJECT button and remove the cassette.



POWER SOURCES (Cont'd)

■ WHEN USING WITH THE CAR BATTERY (By using optional car cord Hitachi VM-CC70E)



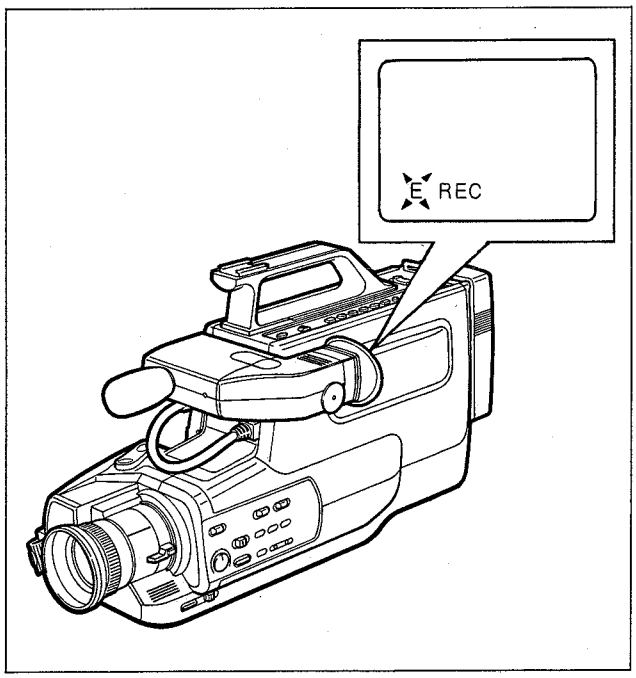
1. Connect the small plug of the car cord to the "DC IN 9.6V" jack of the camera/recorder.
2. Connect the other end of the car cord to the car's cigarette lighter socket.

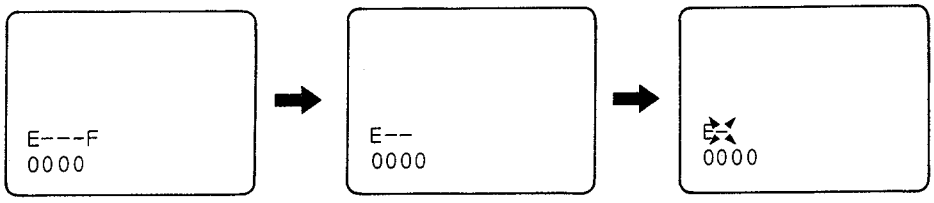
NOTES:
- The car cord is designed to be used only with automobiles having a 12-volt negative ground system.
- To avoid possible damage to your camera/recorder, make sure the car cord you plan to use has positive tip polarity and is capable of converting 12 volts to 9.6 volts such as Hitachi model VM-CC70E.

CHECKING THE BATTERY PACK

When the "E" indication in the electronic viewfinder appears and flashes while the video camera/recorder is operated with a battery pack during recording, it indicates that the battery charge is insufficient. Then, charge it or replace it with a charged battery pack.

NOTE: Whenever the tape counter or time remaining display is present in the viewfinder, it appears with a 3-dash read-out indicating the condition of camera/recorder battery power. When the battery is fully charged, the display reads "E———F". After several minutes, only two dashes appear.
When the battery is very near empty, only one dash remains. When the last dash starts blinking, you should find an alternative power source or recharge the battery before continuing to use your camera/recorder.

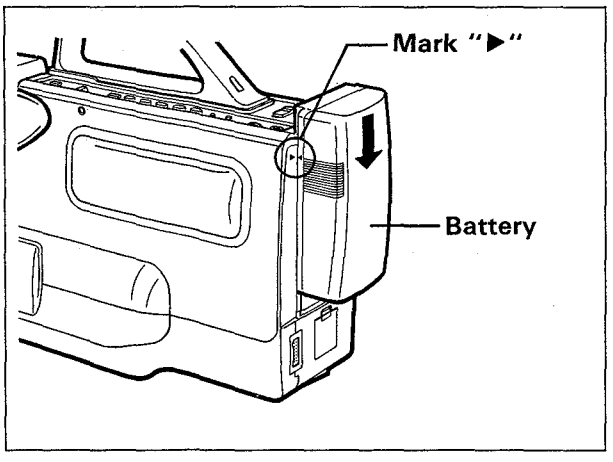




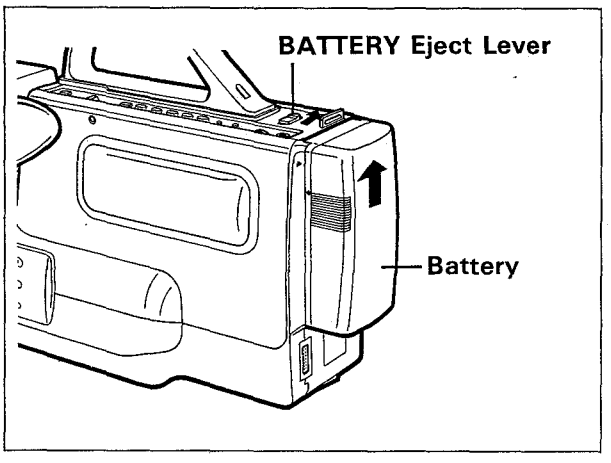
POWER SOURCES

■ WHEN USING WITH THE BATTERY

1. To attach align the mark "▶" on the side of the battery with that on the rear left side of the camera/recorder so that the battery fits into the grooves, and slide the battery downward, as illustrated.

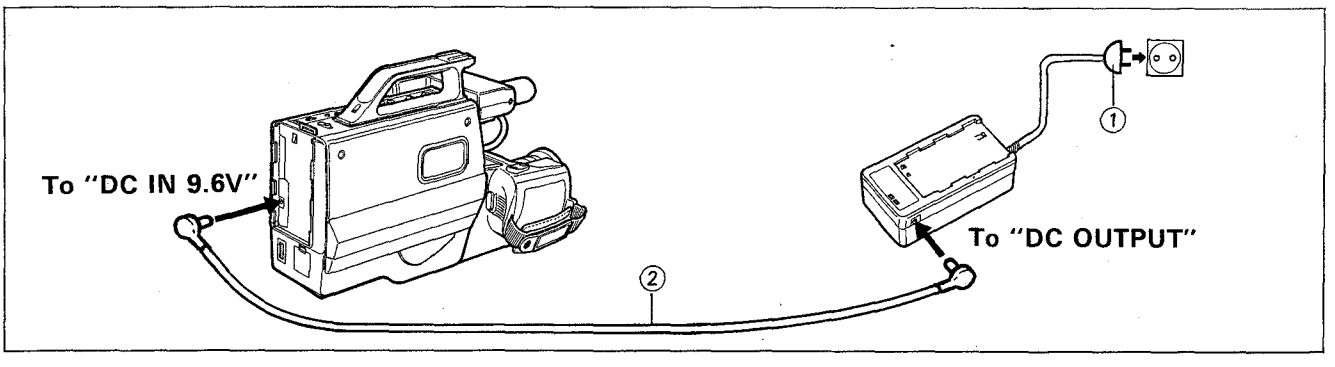


2. To remove slide the battery upward while the BATTERY eject lever in the direction of the arrow.



For use the battery pack, read the "CAUTION FOR BATTERY PACK" on page 28.

■ WHEN USING WITH THE AC ADAPTOR/CHARGER



1. Plug the AC adaptor/charger power cord into AC electrical outlet.

   NOTE: This adaptor/charger is universal for use with AC 100 — 240V around the world.
2. Connect one end of the DC cord (provided) to the "DC IN 9.6V" jack of the camera/recorder.
   Connect the other end of the DC cord to the "DC OUTPUT" of the AC adaptor/charger.

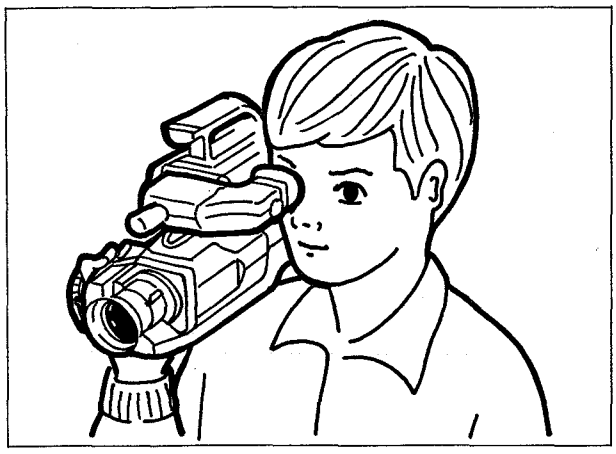
NOTE: The AC adaptor/charger cannot charge the battery and operate the camera/recorder at the same time.
Remove the battery from the AC adaptor/charger to supply power to the camera/recorder.

See the bottom of the AC adaptor/charger.
The rating label is located on the bottom of the AC adaptor/charger.

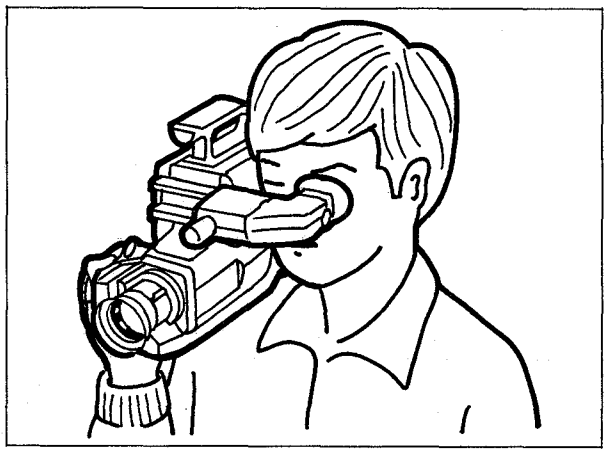
ELECTRONIC VIEWFINDER POSITION ADJUSTMENT

The position of the electronic viewfinder can be adjusted so it can be viewed with the left eye as well as the right eye.

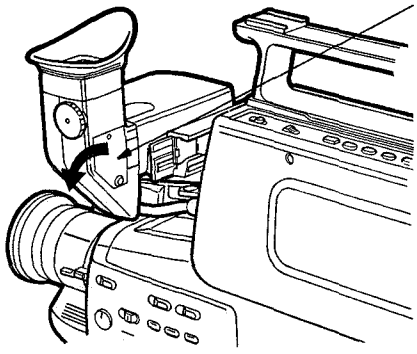
- **When viewing with right eye**



- **When viewing with left eye**



■ **Service Access Door**

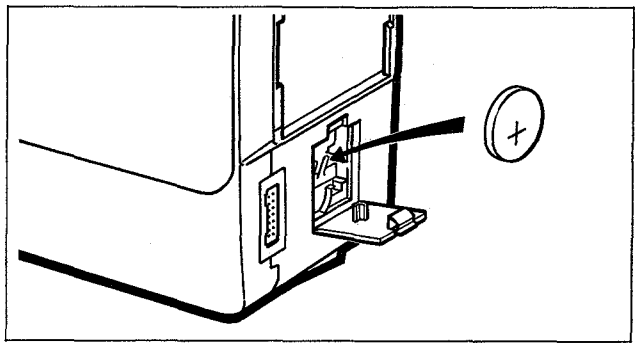


Open to clean picture tube face, mirror and lens. To prevent scratching, use a soft non abrasive cloth, swab or lens cleaning paper.

LOADING BATTERY FOR DATE/CLOCK

You may want to install the clock battery (provided) immediately to prevent misplacing it.

1. Pull the tab to open the cover and expose the compartment.
2. Insert the clock battery with the "+" terminal facing out (as illustrated inside the battery cover).
3. Gently push the cover closed until it snaps into place.



NOTES:

- When replacing the batteries, use 3V micro lithium battery such as Maxell CR2025 or equivalent.
- Instructions for setting the time and date are on page 20. You can do that later if desired after you're more familiar with your camera/recorder.

This product uses a lithium battery which contains dangerous chemicals. Handle and dispose of with great care.

WARNING

- Do not throw in a fire.
- Do not short circuit it.
- Do not disassemble it.
- For disposal place in a plastic bag and put in waste bin.

42. AV OUT Jack
Connect the audio/video output cable to this jack and to the audio and video inputs of your TV/monitor receiver. You may also connect the optional RF converter unit to this jack and your TV receiver.

43. DC IN 9.6V Jack
When using the AC adaptor/charger, connect one end of the DC cord (provided) to this jack and the other end to "DC OUTPUT" of the AC adaptor/charger. When using the car cord (optional), connect this jack and the car's cigarette lighter socket.

44. Cassette Holder
Press EJECT button to open the cassette holder. Be aware of the cassette direction when inserting.
NOTE: Power source must be connected to open the cassette holder.

45. Battery Eject Lever
Release the battery attached to the video camera/recorder.

46. BATTERY Indicator
Indicates the battery condition;
- When the battery is fully charged, the display reads "E———F". When the battery is very near empty, only one dash remains. When the last dash starts blinking, you should find an alternative power source or recharge the battery.

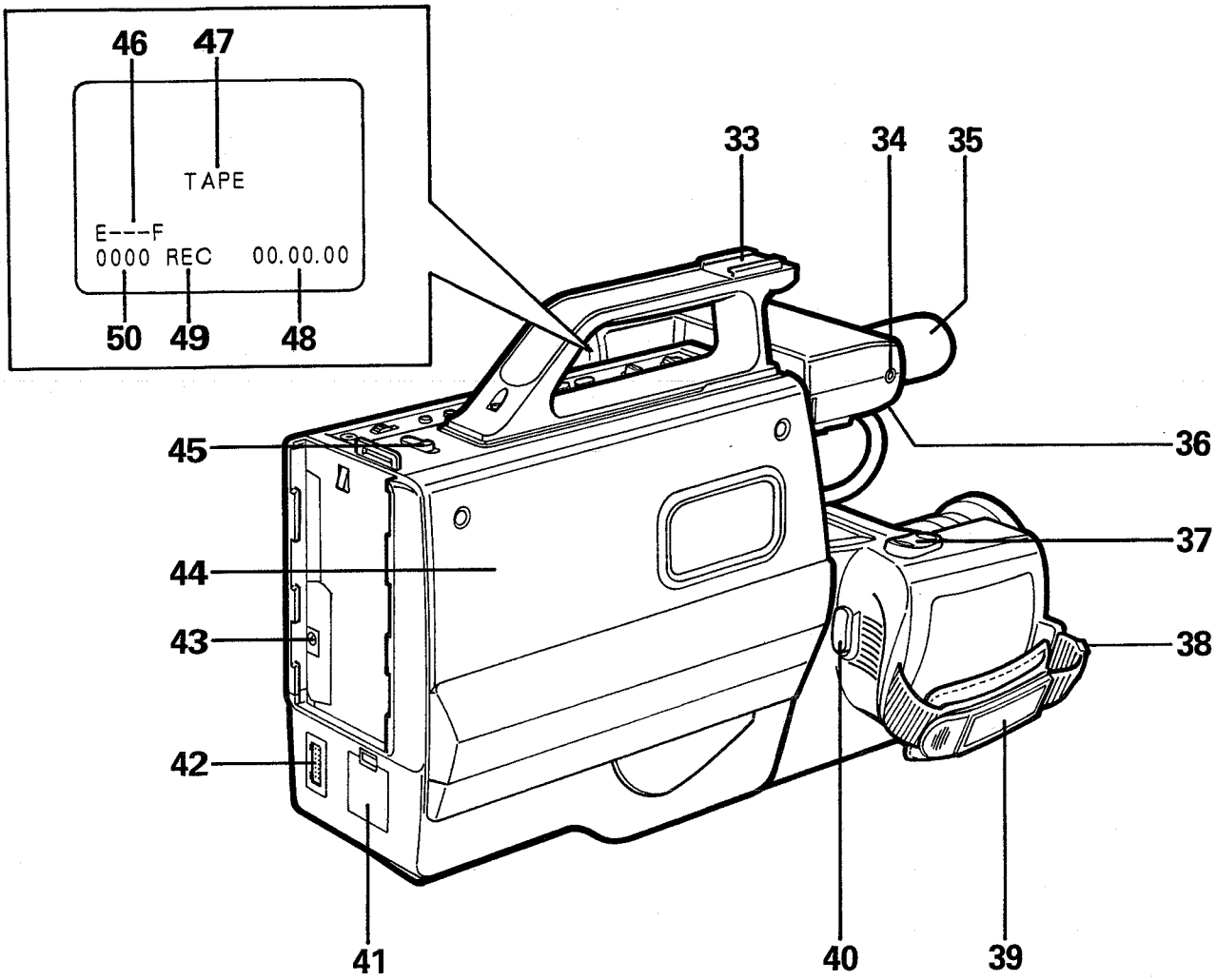
47. TAPE Indicator
When the record start/stop button is pressed, if a cassette without its safety tab is inserted or there is no cassete, "TAPE" blinks for several seconds.

48. DATE/TIME Indicator
Indicate the date/clock during the record or record/pause (stand-by) mode. You can record the clock and/or date with object when recording.

49. MODE Indicator
Indicates the operating modes;
- "REC" appears during the record mode.
- "REWIND" appears during the rewind mode. "FAST FWD" appears during the fast forward mode.
- "PAUSE" appears during the record/pause (stand-by) mode.

50. TAPE COUNTER
Shows tape counter (0000 — 9999) and time remaining.

CONTROLS AND FUNCTIONS



33. Accessory Shoe
Used to attach the camera light. (Not supplied)

34. MIC Jack
Connect an external microphone (Not supplied) here to record sound from the external microphone.
NOTE: Connecting an external microphone automatically switches off the built-in microphone.

35. Microphone
Sensitive to sounds coming from the direction in which the camera is pointed.

36. MIC NORMAL/WIND Switch
This switch is used to reduce noise that occurs due to wind. Place the switch in the "NORMAL" position for normal use.

37. Power Zoom Switch
This switch performs zooming electrically.
"W": Picture becomes wider gradually.
"T": Picture becomes telescopic gradually.

38. Lens Cap Tab
Place the lens cap on this tab when you are ready to record a scene. The tab also prevents the lens cap from swinging around on its cord.

39. Hand Strap
Adjust to best fit to your hand.

40. Record Start/Stop Button
This button is used to control the camera/recorder. When this button is pressed with the camera/recorder set to the recording mode, the tape runs to start recording.
When this button is pressed again, the tape stops and the camera/recorder enters the record/pause (stand-by) mode.

41. Clock Battery Compartment
Pull the tab to open the cover and install the clock battery (provided).

12. **FADE Button**
During recording you can add a professional touch to your recordings by fading in and out of scenes.
NOTE: When you use FADE button to fade in and out, the sound will also fade in and out with the picture.

13. **AUTO/MAN FOCUS Switch**
Set this switch to the "AUTO" position for automatic focusing, and to the "MAN" position for focusing with the focus ring.

14. **IRIS Control**
When this control is in the "AUTO" position, the iris is controlled automatically. Turn this control to the right or left for manual iris control.

15. **PUSH AUTO Focus Button**
Auto focusing can be also performed during manual focus mode by pushing this button.

16. **Zoom Ring (Manual Zooming)**
The picture size can be magnified 8 times with the use of the zoom feature. Just rotate the zoom ring for a close up (T) or wide angle (W) picture. Macro close-up, as close as 1 cm from object, is feasible.

17. **Focus Ring**
Do not attempt to manually turn the focus ring when the camera/recorder is in the auto focus mode.

18. **Lens**
F1.2 (8.7 ~ 70 mm) 8:1 power zoom lens features with auto focus and auto iris functions.

19. **Auto Focus Window**
To automatically focus the camera lens, this window transmits and receives infrared light which is reflected off the subject. Make sure you don't obstruct this window when recording.

20. **OPERATE Switch**
Press this switch to turn camera/recorder on. Press again to turn camera/recorder off.
OPERATE light illuminates when this switch is pressed and camera/recorder is on.

21. **OPERATE/Dew Indicator Light**
Flashing of the light indicates dew condensation on camera/recorder mechanism. While this light is flashing, the unit will not operate. If this ocurs, eject the tape and leave the power on. When the light stops flashing, the unit can be operated.

22. **VIDEO/CAM Select Switch**
This switch changes the camera/recorder to the record mode or to the playback mode. The switch must be in "CAM" position for recording.

23. **EJECT Button**
Press to insert or remove the cassette.

24. **REW Button**
Press this button during stop or fast forward mode, and fast-rewinding starts. "REWIND" indication appears in the viewfinder whenever the tape counter or time remaining is present. Press the button during playback of tape, and the tape is played back in the rewind direction approximately 3 times faster than the normal speed to confirm the recorded contents. Press PLAY button to return to normal playback mode or press STOP button to stop tape movement.
NOTE: You can also visually scan backward when the camera/recorder is record/pause (stand-by) mode by pressing and holding this button.

25. **PLAY Button**
Used for playback of tape recorded in the SP mode.
NOTE: When the camera/recorder is record/pause (stand-by) mode, pressing and holding this button will play the tape at normal.

26. **F.FWD Button**
Press this button during stop or rewind mode, and fast-forwarding starts. "FAST FWD" indication appears in the viewfinder whenever the tape counter or time remaining is present. Press the button during playback of tape, and the tape is played back in the forward direction approximately 3 times faster than the normal speed to confirm the recorded content. Press PLAY button to return to normal playback mode or press STOP button to stop tape movement.
NOTE: You can also visually scan forward when the camera/recorder is record/pause (stand-by) mode by pressing and holding this button.

27. **STOP Button**
The STOP button is used to stop playback, rewind, and fast forward operations. The STOP button has no effect during record operation.

28. **STILL/REC/PAUSE Button**
When this button is pressed during recording, the tape stops and the camera/recorder enters the record/pause (stand-by) mode. When this button is pressed again, the tape runs to resume recording. This button may be also used to display a still picture during playback mode.

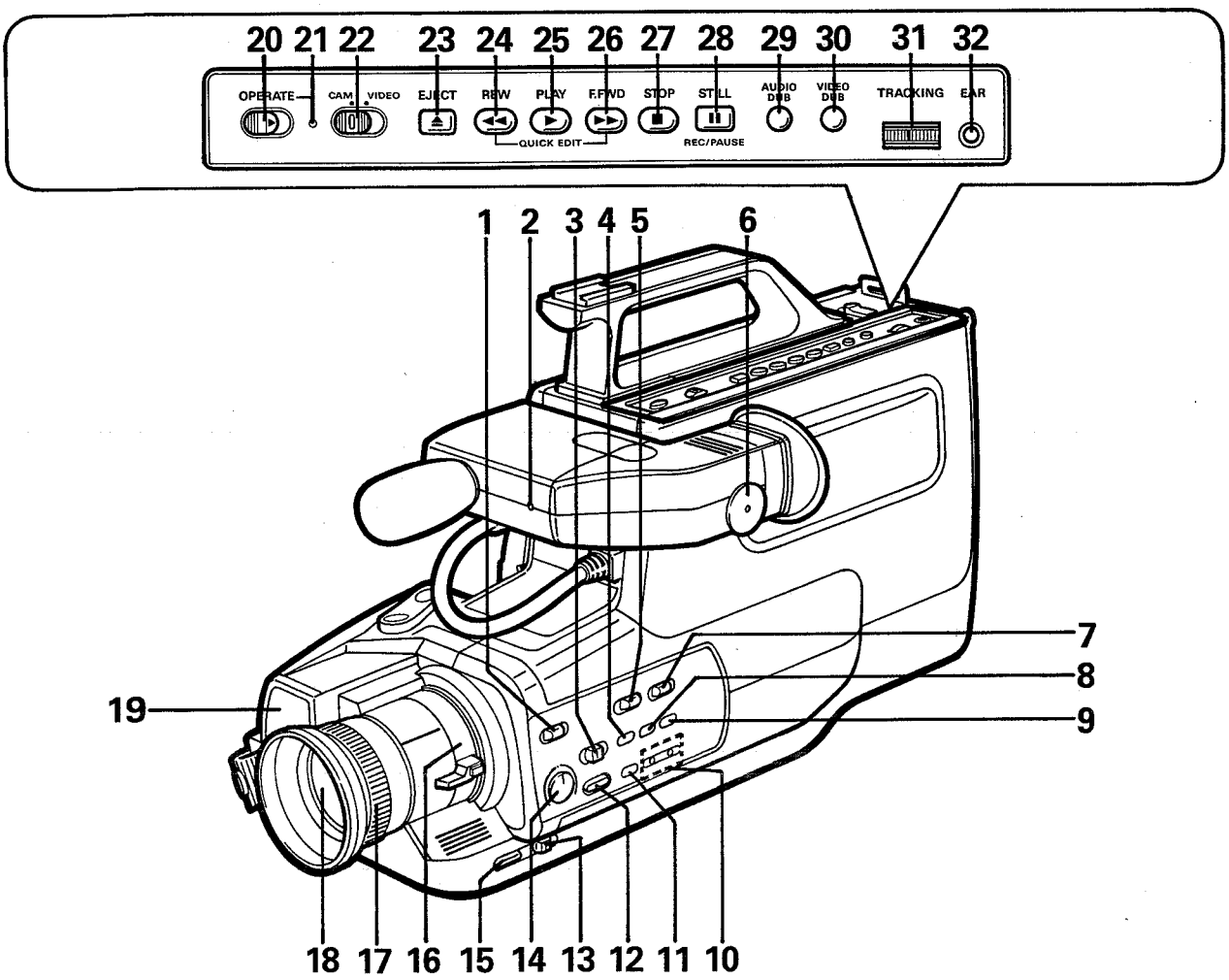
29. **AUDIO DUB Button**
This button is used to record new audio in place of existing audio without erasing the video.

30. **VIDEO DUB Button**
This button is used to record new video in place of existing video without erasing the audio.

31. **TRACKING Control**
Used when playing a tape recorded on another VTR. Adjust for best picture. At all other times leave it in the center position, which can be found as a small detent in the movement of the knob.

32. **EARPHONE Jack**
Sound being recorded by the microphone or played back may be monitored by earphone to this jack.

CONTROLS AND FUNCTIONS



1. **SHUTTER Switch**
   Used to control the shutter speed during recording and/or record/pause (stand-by) mode.

2. **Record Indicator**
   Flashes for about 10 seconds when the SELF TIMER switch is pressed during record/pause (stand-by) mode and stays on to indicate recording starts.

3. **NEGA/POSI Switch**
   Normally set to "POSI".
   Set to "NEGA" for special effects as in a negative film.

4. **DISPLAY Button**
   Pressing this button once causes a 4 digit tape counter and battery indicator to appear in the camera/recorder's viewfinder. Pressing the button again will cause counter memory mark "M" to appear.
   Pressing the button third time will cause battery indicator and the amount of time remaining on the cassette in the camera/recorder.
   Press a 4th time to delete all displays.

5. **TIME LAPSE Switch**
   This switch allows time lapse and one shot recording.

6. **Diopter Control**
   To use the electronic viewfinder without eyeglasses on, turn this control knob for your optimum focus adjustment.

7. **SELF TIMER Switch**
   This switch allows you to start recording after about 10 seconds when the switch is pressed.

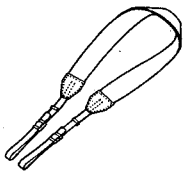
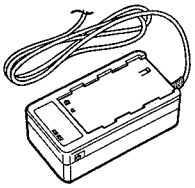
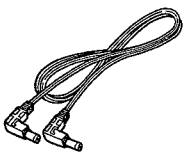
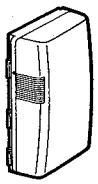
8. **RESET/E-240 Button**
   When the tape counter is displayed in the viewfinder, pressing the button resets the counter to "0000". When the time-remaining read-out is displayed, pressing the button changes the display for extended length E-240 tapes, the indicator under the button will light.

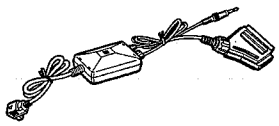
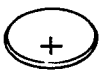
9. **REVIEW Button**
   Used to review the last few seconds of the recorded segment in the record/pause mode.

10. **DATE/TIME Set Buttons**
    These buttons are used to set the clock (time and date) in your camera/recorder so it can be recorded on your tapes for future reference.

11. **DATE/TIME Button**
    Press this button to display the date and clock in the viewfinder. Whenever the date and clock appear in the viewfinder, they will be recorded on the tape.

ACCESSORIES

① Carrying Case	② Shoulder Strap	③ AC Adaptor/Charger	④ DC Cord	⑤ Battery Pack
				

⑥ Earphone	⑦ Audio/Video Output Cable	⑧ Battery for Clock
		

WARNING: Keep this battery away from children.
If swallowed, consult a physician immediately for emergency treatment.

OPTIONAL ACCESSORIES

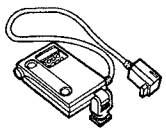
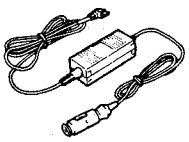
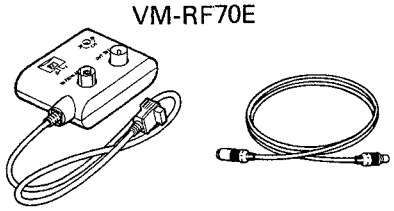
Battery Pack		Multi Image Generator	Car Battery Cord	RF Converter Unit
VM-BP61 (for standard play)	VM-BP63 (for long play)	VM-TL70E	VM-CC70E	VM-RF70E
				

TABLE OF CONTENTS

Controls and functions 4
Electronic viewfinder position adjustment 8
Loading battery for date/clock 8
Power sources 9
Checking the battery pack 10
Charging the battery pack 11
Insertion and removal of cassette 11
Camera recording 12
Using the auto focus feature 13
Using the power zoom feature 14
Using the instant review feature 15
Using the auto iris feature 15
Eyepiece adjustment 15
Using the shutter speed control feature 16
Using the negative/positive inversion feature 16
Using the self timer feature 17
Using the fade-in/fade-out feature 17
Using the time-lapse recording feature 18
Using the one shot recording feature 18
Using the display button 19
Using the memory feature 19
Using the time remaining feature 19
Date/clock setting 20
Using the audio dubbing feature 21
Using the video dubbing feature 22
Connections and operations for viewing the picture played back on your TV 23
Video channel setting 24
Using the F-search and R-search features 25
Using the still feature 25
Using the edit search feature 25
Flying erase head 25
Camera/recorder to VTR dubbing 26
Troubleshooting 27
How to install the shoulder strap 27
Maintenance 28
Specifications 28

SUPPLEMENT

When you are recording with the 1/500 seconds shutter speed or play back the tape on which recording was made with this shutter speed, the top and bottom of the picture may be lost on some TVs connected to the camera/recorder, but this does not indicate a fault.

ERGÄNZUNG

Wenn Sie mit einer Verschlußzeit von 1/500 sek. aufnehmen oder ein Band wiedergeben, das mit dieser Verschlußzeit bespielt wurde, dann können die oberen und unteren Ränder des Bildes bei manchen an den Video-Kamerarekorder angeschlossenen Fernsehern verloren gehen; dies stellt jedoch keine Störung dar.

SUPPLÉMENT

Quand l'enregistrement est réalisé à la vitesse d'obturation de 1/500e de seconde ou que le passage de la bande sur laquelle l'enregistrement a été réalisé à cette vitesse est lue, il peut se produire que les bords supérieur et inférieur de l'image n'apparaissent pas sur certains modèles de récepteurs de télévision reliés à ce camescope bien que ceci n'indique pas une anomalie des appareils.

AANVULLING

Wanneer u een opname hebt gemaakt met een sluitersnelheid van 1/500 sekonde, en u speelt daarna de band af, dan kan het gebeuren dat wanneer u voor de weergave bepaalds TV's gebruikt, het bovenste en onderste gedeelte van het beeld verloren raakt. Dit is echter geen defect.

TILLÄGG

Vid inspelning med slutare 1/500 eller vid avspelning med band som spelats in i denna slutarhastighet kan bildens övre eller undre del "falla bort" på vissa TV-apparater som har anslutits till kamera/bandspelaren. Detta är emellertid inget funktionsfel.

SUPPLEMENTO

Se state registrando con la velocità dell'otturatore di 1/500 di secondo oppure se state riproducendo un nastro registrato con questa velocità dell'otturatore, le estremità superiore ed inferiore dell'immagine possono andare perdute su alcuni televisori collegati alla telecamera/videoregistratore ma ciò non è indice di difetti di funzionamento.

SUPLEMENTO

Cuando graba o con la velocidad de obturador de 1/500 de segundo o reproduce una cinta que se grabó con esta velocidad de obturador, las partes superior e inferior de la imagen pueden perderse en algunos televisores conectados a la cámara/grabadora, pero esto no implica ninguna avería.

P4659792

Printed in Japan